	U.S. DEPARTMENT OF COMMERCE
NATIO	NAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SERVICE
DF	SCRIPTIVE REPORT
Type of Survey	HYDROGRAPHIC
Field No.	<u>N/A</u>
Registry No.	H11846
	LOOALITT
State	Alaska
State General Locality	Alaska Approaches to Sitka
State General Lo <u>cality</u> Sublocality	Alaska Approaches to Sitka Walker Channel to Necker Bay
State General Lo <u>cality</u> Sublocality	Alaska Approaches to Sitka Walker Channel to Necker Bay 2008
State General Locality Sublocality	Alaska Approaches to Sitka Walker Channel to Necker Bay 2008 CHIEF OF PARTY Commander Donald W. Haines, NOA/
State General Lo <u>cality</u> Sublocality	Alaska Approaches to Sitka Walker Channel to Necker Bay 2008 CHIEF OF PARTY Commander Donald W. Haines, NOA/
State General Lo <u>cality</u> Sublocality (Alaska Approaches to Sitka Walker Channel to Necker Bay 2008 CHIEF OF PARTY Commander Donald W. Haines, NOA LIBRARY & ARCHIVES

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Descriptive Report to Accompany Hydrographic Survey H11846

Project OPR-O112-RA-08 Approaches to Sitka, Alaska Walker Channel to Necker Bay Scale 1:10,000 May 30 – June 18, 2008 **NOAA Ship** *Rainier* **(s221)** Chief of Party: Commander Donald W. Haines, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-RA-08 dated April 21, 2008 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is defined from Walker Channel to Necker Bay within the Approaches to Sitka, Alaska. This survey corresponds to sheet "C" in the sheet layout provided with the Letter Instructions. OPR-O112-RA-08 responds to a request from the USCG 17th District Aids to Navigation Branch to provide contemporary hydrography with full bottom multibeam coverage to replace prior inadequate chart data in the area south of Sitka Sound, Alaska.

With the exceptions noted in this report, complete multibeam echosounder (MBES) coverage was achieved in the survey area in waters 8 meters and deeper. In depths less than 8 meters, additional MBES coverage was acquired to either the navigable area limit line (NALL), or the lidar junction provided for this survey, whichever was further offshore. Total mileage acquired by each vessel and system is reference in Table 1.

Shoreline Verification was not performed for the survey area due to the rocky nature of the coast and the sheet's exposure to weather and swell conditions during the time *Rainier* was in the area. Although typical shoreline verification was not performed, the tilted Reson 8125 configuration obtained complete multibeam coverage to the survey limit as defined above. Features that were identified have been digitized and are represented in the accompanying hob files.

Data Acquisition Type	Hull Number with Mileage (nm)			Total		
	1101	1103	1021	2801	2802	
MBES (mainscheme)	24.5	-	111.43	-	59.9	215.7
Crosslines	-	-	17.68	-	-	17.68
Developments/Holidays			24.09	-	1.54	25.63
Total Number of Items Investigated	-	-	-	-	-	0
Total Area Surveyed (sq. nm)	-	-	-	-	-	9.683

Table 1:	Statistics	for survey	H11846

¹ Standing Instructions for Hydrographic Surveys (April 2008), NOS Hydrographic Surveys Specifications and Deliverables (April 2008), OCS Fie ld Procedures Manual for Hydrographic Surveying (May 2008), and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

H11846



Data acquisition was conducted from May 30 to June 18, 2008 (DN151 to DN170).

Figure 1. H11846 Survey Limits and Junctions (Chart 17328).

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-O112-RA-08 Data Acquisition and Processing Report* (DAPR)¹, 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	Multibeam Echosounder
1021	RA-3	Multibeam Echosounder
2802	RA-5	Multibeam Echosounder

Table 2. Data Acquisition Vessels for H11846.

Sound speed profiles were measured with SEACAT SBE- 19+ profiler in accordance with the Specifications and Deliverables and processed using a sheet wide concatenated SVP file using Nearest in Distance within 4 hours.

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

System Certification and Calibration

Refer to NOAA Ship *Rainier* DAPR and Hydrographic Systems Readiness Report (HSRR)² for a complete description of system integration and initial calibration results for equipment and sensors used for this survey.

Sounding Coverage

Project instructions for this survey required 25 meter spaced lines coverage of either multibeam echosounder (MBES) or vertical beam echosounder (VBES) from the inshore limit to 8 meters water depth, and complete MBES in greater than 8 meters water depth. With the exceptions noted in this report, complete multibeam coverage was acquired to either the navigable area limit line (NALL) or the junction survey lines, whichever was further offshore.

Bathymetric coverage was monitored by the creation of daily Digital Terrain Models (DTM's).

Crosslines

Multi-Beam Echo Sounder (MBES) crosslines totaled 17.68 nautical miles, comprising 7.39% of mainscheme hydrography. The mainscheme bathymetry was manually compared to the crossline nadir beams in CARIS HIPS subset mode. Crosslines generally agreed within 0.4 meters of mainscheme hydrography in shallow areas and within 0.6 meters in deeper areas. All vertical offsets between crosslines and mainscheme lines fall within the IHO accuracy limit specified for Order 1 surveys for the corresponding depth.³

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 junctions with H11846 (See Figure 1):

Registry #	Scale	Date	Junction side
H11845	1:10,000	2008	Northwest
H11586	1:10,000	2007	Southwest
H11679	1:10,000	2007	Northeast
H11540	1:10,000	2006	Shoreline

Survey H11845 was completed concurrently with survey H11846 during project OPR-O112-RA-08. Comparisons between the HDCS data were conducted manually in CARIS subset mode. Agreement between survey soundings were within 0.4 meters, inside the IHO accuracy limit for Order 1 surveys.⁴

Surveys H11586 and H11679 were completed by Rainier in 2007 and junctioned with H11846. Again, comparisons between HDCS data were conducted manually in CARIS subset mode. Agreement with survey H11586 soundings were generally within 0.8 meters, falling within the IHO accuracy limit for Order 1 surveys. On the steep slopes found in rocky offshore areas, current and junction survey soundings varied by up to 3.2 meters. This offset can be partially attributed to horizontal positioning errors which translate to vertical offsets on such steep slopes. The larger discrepancy falls outside the IHO accuracy limit for Order 1 surveys. Agreement with survey H11679 soundings were generally within 0.8 meters, also within IHO accuracy limits for Order 1 surveys and in steeply downsloping areas the difference between soundings varied up to 2.3 meters. Again, the offset can be partially attributed to horizontal positioning errors which translate to vertical offsets on such steep slopes. The sounding variance of 2.3 meters falls outside the IHO accuracy limit for Order 1 surveys. A possible source of vertical error could be outer beam flutter in the H11846 data caused by the steeply sloping bathymetry of the area (i.e. downslope noise). Additionally, a comparison between H11679 and H11846 soundings was made more difficult because of the differences in sonar technology used for each survey. In the area of comparison, often in excess of 75 meters depth, the H11679 data was collected with older less reliable survey systems and technology.⁵

Survey H11540, a Tenix LADS lidar survey, was junctioned with H11846 by comparing BASE surfaces in CARIS HIPS. In places the surfaces agreed well, within 0.1meters of each other. More often the H11846 surface was 0.1 to 0.5 meters shoaler than the lidar data and in a few spots H11540 was 0.1 to 0.4 meters shoaler. There appeared to be no trend in where one survey was shoaler than the other. This difference could in part be due to comparing a 3m resolution lidar surface to the final combined H11846 surface derived from a 1m resolution surface in this depth range. In a few areas the difference between surfaces varied by as much as 1.9 meters with the H11846 surface being generally shoaler. See Figure 2 where H11540 is mustard and H11846 is red in color. The areas of greater discrepancy were found in the outer edges of the H11540 survey where coverage was patchier and there was increased turbidity. The hydrographer recommends charting soundings from H11846 multibeam survey in all areas of overlap.⁶



Figure 2: H11846 and H11540 lidar comparison.

Data Quality Factors

Data Gaps (Holidays)

Several small holidays were found between the mainshceme data and lidar coverage. The lidar coverage was sparse throughout the survey area. For the most part, H11846 junctions with the Lidar Limit Line except for in a few cases. When *Rainier* first received the junction survey, limits in MapInfo were used for survey planning and assessment. Near the end of acquisition it was noted that the Notebook Lidar Limit Line and the MapInfo lidar junction lines were different, with the Notebook line generally inshore of the MapInfo line. Therefore, with the remaining time allotted for the project, some holidays were unable to be filled.⁷ Other lidar junction holidays were unable to be filled due to the difficulty in maneuvering a survey launch in tight quarters or rough sea state conditions. See Figure 3 for example. The image is from MapInfo with the H11846_Combined DTM (red and yellow overlaid on chart 17328), the NALL Line (yellow dashed line), original MapInfo lidar junctions limit line (green) and the Notebook Lidar Limit Line (red).



Figure 3: Incorrect lidar junction and associated holidays.

A few coverage gaps found in H11846 are due to extensive kelp and foul areas in some of the near-shore survey areas, specifically to the south of Yamani Island and to the northeast of Yamani Cove (see Figure 4). Additionally, several holidays were identified on the tops of rocks which were too shoal to survey over safely. Most of these rocks have also been identified as

DToNs (see Section D.1.b. Dangers to Navigation) and a few examples are identified in Figures 4, 5, 10, 11, and 12.



Figure 4: Holidays due to kelp (top) and shoal (bottom).



Figure 5: Holiday due to shoal south of southernmost Guibert Islets.

H11846

Several gaps between the 1 to 2 meter and 2 to 4 meter resolution finalized BASE surfaces in CARIS have been found in several downslope areas in survey H11846. The depth range overlap for each resolution has been increased to close these gaps, but in an attempt to maintain the most accurate BASE surface representation at the appropriate resolution, this overlap was kept to a minimum. In some instances, valid data are present but not being represented by one or both CARIS BASE surfaces while in other instances, an actual data holiday exists due to the steep slope and inadequate line planning. In the areas where a gap with supporting data was identified, the data were examined and no features were found. Considering that all of these gaps are in steeply downsloping areas, the gaps are not considered to be significant. See Figure 6 and 7 as examples.⁸



Figure 6: Junction gap in CARIS BASE surfaces between resolutions



Figure 7: Junction gap in CARIS BASE surfaces between resolutions

B3. Data Reduction

Data reduction procedures for survey H11846 conform to those detailed in the *OPR-O112-RA-08 DAPR*.

The near shore MBES hydrography for this survey was run at high tide and/or with a tilted Reson 8125 sonar head along the shoreline of Necker Bay, the Slate Islets, Aspid Cape, and the Guibert Islets. After correction for water levels, some soundings were found to have negative depths (i.e., elevations above MLLW). Under the current process, these cannot be portrayed in the finalized BASE surface, so a data gap appears. The locations of these induced data gaps are in the inshore areas, possibly over rocks, reefs, and ledges that are submerged or partially submerged at high tide. If these soundings are needed, please see the original HDCS data.⁹

B4. Data Representation

Survey H11846 was processed using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. CUBE surfaces processed at 1 meter resolution were computed using the "shallow" CUBE parameters whereas CUBE surfaces with resolutions of 2 and 4 meters were computed using "deep" CUBE parameters. The CUBE parameters file is included with the data submissions in the vessel configuration folder. Final BASE surface resolutions and depth ranges were set in accordance with the Specification and Deliverables Complete Multibeam Coverage requirements. Field Sheets have a grid resolution of at least 10% of the depth and are smaller than 25×10^6 nodes. The submission Field Sheet and BASE Surface structure are shown in Figures 8 and 9.



Figure 8: Layout of field sheets for BASE surfaces of H11846



Figure 9: Field sheets and BASE surfaces submitted with H11846.

Name of Fieldsheet	Resolution	Туре	Purpose
H11846_A			
-H11846_A_4m_Final	4 meter	CUBE	Cube Base surface
-H11846_Combined	4 meter	CUBE	Combined Cube surfaces
H11846_B			
-H11846_B_2m_Final	2 meter	CUBE	Cube Base surface
H11846_C			
-H11846_C_2m_Final	2 meter	CUBE	Cube Base surface
H11846_D			
-H11846_D_1m_Final	1 meter	CUBE	Cube Base surface
H11846_E			
-H11846_E_1m_Final	1 meter	CUBE	Cube Base surface
H11846_F			
-H11846_F_1m_Final	1 meter	CUBE	Cube Base surface

Table 3 describes all BASE surfaces submitted as part of Survey H11846, while Table 4 identifies the depth range used for each resolution surface.

Table 3: All Fieldsheets and BASE surfaces submitted as part of Survey H11846

Depth Range of Finalized Surface	Resolution
0–24 meters	1 meter
18–56 meters	2 meter
46–115 meters	4 meter

Table 4: Depth range and resolution of finalized surfaces

Soundings and contours were generated in CARIS HIPS from the final combined BASE surface for field unit review purposes. They are included for reference only and are not intended as a deliverable.

C. VERTICAL AND HORIZONTAL CONTROL

Project OPR-O112-RA-08 did not require static GPS observations or other horizontal control work, and all tide corrections were generated from CO-OPS maintained tide stations. Thus, no Horizontal and Vertical Control Report will be submitted.

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. The differential corrector beacons utilized for this survey are given in Table 5.

Location	Frequency	Operator	Distance	Priority
Biorka Island	305 kHz	USCG	17 nm	Primary
Level Island	295 kHz	USCG	78 nm	Secondary
Table 5: Differential Corrector Sources for H11846				

Table 5: Differential Corrector Sources for H11846.

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 Sitka, AK (945-1600) served as control for datum determination and as the primary source for water level reducers for survey H11846.

No tertiary gauges were required.

All data were reduced to MLLW using final approved Tidal Constituent And Residual Interpolator (TCARI) water levels using the TCARI file from O112RA2008P-TCARI.tc and station Sitka, AK (945-1600) with final application using the tide corrector file 9451600 verified thru20080630.txt.

The request for Final Approved Water Levels for H11846 was submitted to CO-OPS on June 19th. 2008 and the Final Tide Note was received on June 24, 2008. This documentation is included in Appendix IV.¹⁰

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11846 was compared with the following charts manually in CARIS HIPS by overlaying the appropriate final BASE surface over the chart:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
17328	1:40,000	7 th Ed, Nov. 2003	11/11/2003
17320	1:217,828	18 th Ed, Mar. 2008	03/04/2008
			1

 Table 6: Charts compared with H11846
 \$\$\$

Chart 17320

The scale of Chart 17320 is such that only a cursory comparison was made with survey H11846. As one would expect with a chart of this scale, many of the rocks have been cartographically shifted to such an extent that a detailed comparison is pointless. In some areas, the charted depths agreed well with the survey soundings while in others, there was up to a 5 fathom discrepancy. With no observable trend in orientation, some survey soundings were shoaler than charted and in other locations the charted depths were shoaler than H11846 soundings. The Hydrographer recommends removing the charted depths and charting as per the digital data so that H11846 soundings supersede all prior survey and charted depths in the common area. The disproved islet in the Slate Islets that was identified on Chart 17328 is not present on Chart 17320, no correction need be made.¹¹

Chart 17328

Chart 17328 covers all of survey H11846. Soundings from H11846 were generally shoaler than charted depths which is to be expected with the increased sounding density provided by modern sonar technology. There appears to be no obvious trend in the magnitude of difference between H11846 soundings and charted depths as the differences range from 0.3 to 23 fathoms. In some instances, the H11846 survey soundings were deeper than charted by an average of 2 fathoms. In one example, the H11846 sounding was 4 fathoms deeper than charted. Again, there was no general trend to location of these deeper soundings. In all cases, these discrepancies are covered with complete MBES. The hydrographer recommends superseding charted depths with H11846 digital data in the common area.¹²

Several shoal areas are not charted correctly. In three of these cases, complete MBES coverage was not safe to acquire due to the shallow nature of the feature and the rough sea state conditions. However, sufficient MBES coverage was acquired in each case to identify the feature (Figures 10, 11, and 12). Considering that the H11846 data are shoaler than the charted depths in the area, the Hydrographer recommends that the shoalest H11846 sounding over the feature supersede prior charted depths.¹³



Figure 10: Significant shoal (2.8m, 1.54fm) in 9 fathom charted (17328) area.



Figure 11: Significant shoal (3.1m, 1.7fm) in 5 ¹/₂ fathom charted (17328) area.



Figure 12: Significant shoal (2.4m, 1.3fm) in 7 ¹/₂ fathom charted (17328) area.

Shoreline Discrepancies

A charted (17328) islet located at 56°40'29"N, 135°13'35"W was disproved with complete MBES coverage. The charted 6 ¹/₂-fathom shoal area to the southwest of the disproved islet is charted correctly (Figure 12). See the Notebook session for features that are recommended to be removed, modified and/or deleted from the chart (17328).¹⁴



Figure 13: Shoreline discrepancies in Slate Islets on chart 17328.

Several charted (17328) rocks that were positioned outside the lidar junction limits were disproved with complete MBES coverage (see Figure 13 and 14). All of these rocks had a SORIND of US,US,graph,Chart 17328. Refer to the H11846_NTBK.wrk session for locations, remarks and recommendations concerning the disproved rocks.¹⁵





Figure 15: Charted rock disproval on chart 17328 southwest of Slate Islets.

A comparison was made with the provided composite source file in lieu of ENC comparison.

D.1.b. Dangers to Navigation

Twenty three (23) DToNs were found on survey H11846 and reported to the Marine Chart Division via email on October 30, 2008. A copy of each Danger to Navigation Report is included in Appendix I, and a copy of each DTON email to MCD is located in Appendix V of this Descriptive Report.¹⁶

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

No AWOIS items fall the within the survey limits of H11846.¹⁷

Additional Items

No additional charted items were investigated and no other features were located on survey H11846.

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.b. Shoreline

Shoreline Source

The Pacific Hydrographic Branch provided *Rainier* with a list of selected features for further investigation from lidar surveys H11540. These features needed further investigation due to doubtful soundings or charted features found and/or not found in lidar survey data and are recommended for either removal from or addition to the chart.

In addition, the source shoreline for project OPR-O112-RA-08 is a composite source file compiled from photogrammetric survey project GC10517, charted features from the digital Electronic Navigational Chart (ENC) US5AK3GM and US5AK3SM, as well as prior survey features. The composite source file was trimmed down to include only the shoreline and features that applied to each individual survey.

Shoreline Verification

Due to time constraints, shoreline verification was not performed for survey H11846. However, several features addressed in the Chart Comparison section (D.1., Chart 17328) were covered

with complete multibeam coverage and have been moved from the H11846_Field_Verified.hob layer to the H11846_Disprovals.hob layer.

All shoreline data is submitted in Caris Notebook .hob files. The session H11846_NTBK contains the following:

HOB File	Purpose and Contents
H11846_Comp_Source.hob	Original source data filtered to the limits of survey
	H11846
H11846_Field_Verified_Comp_Source.hob	Field verified source features and shoreline, including
	edits and updates not requiring DPs.
H11846_Disprovals.hob	Items removed from the field verified composite source
	requiring removal from chart.
H11846_Discrepency.hob	lidar discrepancies or doubtful soundings.

 Table 7: List and Description of Notebook HOB files.

Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement shoreline information compiled on the composite source file and charts as described above.¹⁸

D.2.c. Aids to Navigation

There are no Aids to Navigation within the limits of H11846.¹⁹

D.2.d. Overhead Features

There are no overhead features within the limits of survey H11846.²⁰

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H11846, and none were detected by the survey.²¹

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11846, and none were observed to be operating in the area.²²

D.2.g. Bottom Samples

Bottom samples were not performed in survey H11846.²³

D.2.h. Other Findings

Upon the entrance to Necker Bay, the chart (17328) notes two conspicuous cliffs located along the north shore of Necker Bay. These two cliffs were verified in the field and should be retained on the chart.²⁴

The breakers that are charted (17328) throughout the survey area were verified in the field and should be retained as charted.²⁵

The charted (17328) kelp areas throughout the survey area were verified in the field and should be retained as charted. Additionally, a new kelp area was identified to the south of Yamani Island. The hydrographer recommends adding a kelp symbol to the chart. See the Field Verified layer in H11846_NTBK session for the added kelp feature.²⁶

E. APPROVAL

As Chief of Party, Field operations for hydrographic survey H11846 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 June 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>

Data Acquisition and Processing Report for OPR-O112-RA-08 July 25, 2008 N/CS34 Coast Pilot Report for OPR- O112-RA-08 will be submitted under separate cover N/CS26

CAPT Donald W. Haines, NOAA 2008.10.31 11:12:20 -08'00'

Office

Approved and Forwarded:

Captain Donald W. Haines, NOAA Commanding Officer

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

Survey Sheet Manager:

Damarthe Ulli 2008.10.31 16:29:06 Z Samantha K. Allen

Date Sent

Assistant Survey Technician, NOAA Ship *Rainier*

James B Jacobson I have reviewed this document 2008.10.30 15:48:04 -08'00'

I am the author of this document

Chief Survey Technician:

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

I have reviewed this document 2008.10.31 09:24:00 -08'00'

Field Operations Officer:

Lieutenant Charles Yoos, NOAA Field Operations Officer

Revisions and Corrections During Office Processing and Certification

¹ Filed with project records.

² Filed with project records.

³ Concur with clarification; all data are adequate to supersede charted data within the common area.

⁴ Concur.

⁵ In areas of overlap between surveys H11679, H11586, and H11846 the shoalest soundings were selected for charting.

⁶ Concur.

⁷ During HCell compilation holidays were addressed on a case by case basis. Some were not represented due to insignificance and others were preserved. The M_QUAL objects within the HCell depict the aprorpiate coverage of new regions of data for the chart.

⁸ Data gaps were carefully examined and addressed on a case by case basis during the survey acceptance review (SAR) and HCell compilation. Chart survey extents as represented in H11846_CS.000.

⁹ A newer version of CARIS HIPs and SIPs was used to re-generate base surfaces during the SAR. With the new version negative depths did not cause gaps in the surfaces.

¹⁰ Tide note is appended to this report.

¹¹ Concur.

¹² Concur.

¹³ Concur.

¹⁴ H11846_CS.000 contains a blue note recommending this island be removed from the chart.

¹⁵ Chart data per H11846_CS.000.

¹⁶ DTON report is appended to this report.

¹⁷ Concur.

¹⁸ Concur with clarification, data from the submitted notebook files (along with other sources) were used in the compilation of H11846_CS.000. Chart per H11846_CS.000.

¹⁹ Concur.

²⁰ Concur.

²¹ Concur.

²² Concur.

²³ Five bottom samples were retained from chart 17328. The remaining charted bottom samples are recommended for removal and to be replaced by the rocky seabed areas digitized from the base surfaces

²⁴ Concur.

²⁵ Concur.

²⁶ Concur with clarification, charted kelp symbols were imported into H11846_CS.000, and newly surveyed points of kelp from the notebook files have been included in H11846_CS.000 also.

H11846 DToN Report

Registry Number:	H11846
State:	Alaska
Locality:	Approaches to Sitka
Sub-locality:	Walker Channel to Necker Bay
Project Number:	OPR-0112-RA-08
Survey Dates:	05/30/2008 - 06/18/2008

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17328	7th	11/01/2003	1.40.000 (17328-1)	USCG LNM: 06/22/1999 (04/22/2008) CHS NTM: None (03/28/2008) NG A NTM: None (04/26/2008)
17328	/111	11/01/2003	1.40,000 (17526_1)	NOA N INI. None (04/20/2008)
17326	16th	11/01/2007	1:40,000 (17326_1)	[L]NTM: ?
17320	18th	03/01/2008	1:217,828 (17320_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_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	Rock	14.04 m	56° 36' 58.4" N	135° 07' 54.4" W	
1.2	Shoal	13.86 m	56° 37' 07.6" N	135° 07' 51.3" W	
1.3	Shoal	14.32 m	56° 37' 27.7" N	135° 07' 57.3" W	
1.4	Shoal	12.48 m	56° 37' 19.5" N	135° 07' 58.5" W	
1.5	Shoal	17.95 m	56° 37' 37.2" N	135° 07' 53.7" W	
1.6	Rock	17.20 m	56° 38' 06.3" N	135° 08' 21.3" W	
1.7	Rock	6.32 m	56° 38' 38.2" N	135° 08' 09.4" W	
1.8	Rock	6.95 m	56° 37' 54.2" N	135° 08' 13.0" W	

1.9	Shoal	15.50 m	56° 38' 46.8" N	135° 08' 47.5" W	
1.10	Rock	8.43 m	56° 39' 40.5" N	135° 08' 46.7" W	
1.11	Rock	6.86 m	56° 38' 34.5" N	135° 08' 13.2" W	
1.12	Shoal	16.03 m	56° 37' 45.2" N	135° 08' 01.1" W	
1.13	Shoal	13.12 m	56° 38' 44.6" N	135° 09' 03.2" W	
1.14	Rock	1.67 m	56° 38' 17.3" N	135° 09' 34.5" W	
1.15	Rock	0.35 m	56° 38' 33.2" N	135° 09' 57.9" W	
1.16	Shoal	9.98 m	56° 40' 18.6" N	135° 08' 31.5" W	
1.17	Rock	10.90 m	56° 39' 59.6" N	135° 12' 11.6" W	
1.18	Shoal	10.38 m	56° 38' 50.9" N	135° 10' 27.3" W	
1.19	Rock	2.40 m	56° 39' 52.5" N	135° 10' 52.5" W	
1.20	Rock	3.26 m	56° 40' 04.9" N	135° 11' 12.5" W	
1.21	Rock	4.59 m	56° 40' 25.2" N	135° 10' 27.1" W	
1.22	Rock	2.59 m	56° 38' 43.1" N	135° 08' 13.5" W	
1.23	Rock	3.89 m	56° 38' 41.4" N	135° 10' 09.2" W	

1 - Danger To Navigation

1.1) Profile/Beam - 118/51 from h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 36' 58.4" N, 135° 07' 54.4" W
Least Depth:	14.04 m (= 46.05 ft = 7.674 fm = 7 fm 4.05 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.380 m ; TVU (TPEv) ± 0.161 m
Timestamp:	2008-164.00:07:09.825 (06/12/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006
Profile/Beam:	118/51
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 7.67 fms surveyed 68 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/358_0006	118/51	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

7 ¹/2fm (17328_1, 17320_1, 16016_1, 530_1)

7fm 4ft (531_1)

14.0m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC) Attributes: OUASOU - 1:depth known

tes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 14.035 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged

Feature Images



Figure 1.1.1

1.2) Profile/Beam - 602/2 from h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 07.6" N, 135° 07' 51.3" W
Least Depth:	13.86 m (= 45.47 ft = 7.578 fm = 7 fm 3.47 ft)
TPU (±1.96σ):	THU (TPEh) ±1.378 m ; TVU (TPEv) ±0.174 m
Timestamp:	2008-164.00:08:25.539 (06/12/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006
Profile/Beam:	602/2
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 7.58 fms surveyed 110 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/358_0006	602/2	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 7.58 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

7 ¹/2fm (17328_1, 17320_1, 16016_1, 530_1)

7fm 3ft (531_1)

13.9m (500_1, 50_1)

S-57 Data

Sounding (Sounding)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water

Feature Images



Figure 1.2.1

1.3) Profile/Beam - 1861/82 from h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 27.7" N, 135° 07' 57.3" W
Least Depth:	14.32 m (= 46.97 ft = 7.829 fm = 7 fm 4.97 ft)
TPU (±1.960):	THU (TPEh) ±1.377 m ; TVU (TPEv) ±0.162 m
Timestamp:	2008-164.00:11:19.846 (06/12/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 358_0006
Profile/Beam:	1861/82
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 7.83 fms surveyed 135 m offshore of chd (17328) ledge.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/358_0006	1861/82	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 7.83 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

7 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

7fm 5ft (531_1)

14.3m (500_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
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Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water


Figure 1.3.1

1.4) Profile/Beam - 194/2 from h11846 / 1021_reson8101_hvf / 2008-163 / 363_0002

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 19.5" N, 135° 07' 58.5" W
Least Depth:	12.48 m (= 40.95 ft = 6.825 fm = 6 fm 4.95 ft)
TPU (±1.96σ):	THU (TPEh) ±1.377 m ; TVU (TPEv) ±0.169 m
Timestamp:	2008-164.00:02:52.171 (06/12/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 363_0002
Profile/Beam:	194/2
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 6.83 fms surveyed 120 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/363_0002	194/2	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 6.83 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

6 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

6fm 5ft (531_1)

12.5m (500_1, 50_1)

S-57 Data

Scoulding (SoonDO)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.4.1

1.5) Profile/Beam - 888/9 from h11846 / 1021_reson8101_hvf / 2008-163 / 375_0022

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 37.2" N, 135° 07' 53.7" W
Least Depth:	17.95 m (= 58.87 ft = 9.812 fm = 9 fm 4.87 ft)
TPU (±1.96σ):	THU (TPEh) ±1.377 m ; TVU (TPEv) ±0.169 m
Timestamp:	2008-164.00:25:00.703 (06/12/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 375_0022
Profile/Beam:	888/9
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 9.81 fms surveyed 138 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/375_0022	888/9	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 9.81 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

9 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

9fm 5ft (531_1)

17.9m (500_1, 50_1)

S-57 Data

	Geo object 1:	Sounding (SOUNDG)
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Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.5.1

1.6) Profile/Beam - 205/88 from h11846 / 1021_reson8101_hvf / 2008-163 / 904_2216

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 06.3" N, 135° 08' 21.3" W
Least Depth:	17.20 m (= 56.43 ft = 9.406 fm = 9 fm 2.43 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.378 m ; TVU (TPEv) ± 0.165 m
Timestamp:	2008-163.22:16:32.942 (06/11/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-163 / 904_2216
Profile/Beam:	205/88
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 9.41 fms surveyed 110 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-163/904_2216	205/88	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

9 ¼fm (17328_1, 17320_1, 16016_1, 530_1)

9fm 2ft (531_1)

17.2m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 17.201 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.6.1

1.7) Profile/Beam - 907/4 from h11846 / 1021_reson8101_hvf / 2008-169 / 301_2204

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 38.2" N, 135° 08' 09.4" W
Least Depth:	6.32 m (= 20.73 ft = 3.456 fm = 3 fm 2.73 ft)
TPU (±1.96σ):	THU (TPEh) ±1.377 m ; TVU (TPEv) ±0.159 m
Timestamp:	2008-169.22:07:28.382 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 301_2204
Profile/Beam:	907/4
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 3.46 fms

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/301_2204	907/4	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

3 ¹/2fm (17328_1, 17320_1, 16016_1, 530_1)

3fm 2ft (531_1)

6.3m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 6.320 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.7.1

1.8) Profile/Beam - 545/85 from h11846 / 1021_reson8101_hvf / 2008-169 / 343_1942

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 54.2" N, 135° 08' 13.0" W
Least Depth:	6.95 m (= 22.81 ft = 3.802 fm = 3 fm 4.81 ft)
TPU (±1.96σ):	THU (TPEh) ±1.376 m ; TVU (TPEv) ±0.159 m
Timestamp:	2008-169.19:43:24.723 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 343_1942
Profile/Beam:	545/85
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 3.80 fms surveyed 88 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/343_1942	545/85	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

3 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

3fm 5ft (531_1)

7.0m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 6.953 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.8.1

1.9) Profile/Beam - 387/2 from h11846 / 1021_reson8101_hvf / 2008-169 / 445_2157

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 46.8" N, 135° 08' 47.5" W
Least Depth:	15.50 m (= 50.86 ft = 8.477 fm = 8 fm 2.86 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.378 m ; TVU (TPEv) ± 0.189 m
Timestamp:	2008-169.21:57:51.147 (06/17/2008)
Survey Line:	$h11846 \ / \ 1021 _ reson8101 _ hvf \ / \ 2008 - 169 \ / \ 445 _ 2157$
Profile/Beam:	387/2
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 8.48 fms surveyed 150 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/445_2157	387/2	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 8.48 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

8 ¹/2fm (17328_1, 17320_1, 16016_1, 530_1)

8fm 3ft (531_1)

15.5m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDO)	Geo object 1:	Sounding (SOUNDG)
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Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.9.1

1.10) Profile/Beam - 263/20 from h11846 / 1021_reson8101_hvf / 2008-169 / 452_2310

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 39' 40.5" N, 135° 08' 46.7" W
Least Depth:	8.43 m (= 27.67 ft = 4.611 fm = 4 fm 3.67 ft)
TPU (±1.96σ):	THU (TPEh) ±1.376 m ; TVU (TPEv) ±0.160 m
Timestamp:	2008-169.23:11:25.699 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 452_2310
Profile/Beam:	263/20
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 4.61 fms surveyed 65 m offshore of chd (17328) ledge.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/452_2310	263/20	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

4 ½fm (17328_1, 17320_1, 16016_1, 530_1)

4fm 3ft (531_1)

8.4m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 8.433 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.10.1

1.11) Profile/Beam - 173/6 from h11846 / 1021_reson8101_hvf / 2008-169 / 578_2219

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 34.5" N, 135° 08' 13.2" W
Least Depth:	6.86 m (= 22.52 ft = 3.753 fm = 3 fm 4.52 ft)
TPU (±1.96σ):	THU (TPEh) ±1.376 m ; TVU (TPEv) ±0.159 m
Timestamp:	2008-169.22:20:17.310 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 578_2219
Profile/Beam:	173/6
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 3.75 fms surveyed 52 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/578_2219	173/6	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

3 ¾fm (17328_1, 17320_1, 16016_1, 530_1)

3fm 4ft (531_1)

6.9m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 6.864 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.11.1

1.12) Profile/Beam - 275/65 from h11846 / 1021_reson8101_hvf / 2008-169 / 616_1928

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 37' 45.2" N, 135° 08' 01.1" W
Least Depth:	16.03 m (= 52.59 ft = 8.764 fm = 8 fm 4.59 ft)
TPU (±1.96σ):	THU (TPEh) ±1.378 m ; TVU (TPEv) ±0.162 m
Timestamp:	2008-169.19:28:50.551 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 616_1928
Profile/Beam:	275/65
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 8.76 fms surveyed 93 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/616_1928	275/65	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 8.76 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

8 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

8fm 4ft (531_1)

16.0m (500_1, 50_1)

S-57 Data

Sounding (SOUNDO)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.12.1

1.13) Profile/Beam - 13/6 from h11846 / 1021_reson8101_hvf / 2008-169 / 903_2052

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 44.6" N, 135° 09' 03.2" W
Least Depth:	13.12 m (= 43.05 ft = 7.175 fm = 7 fm 1.05 ft)
TPU (±1.96 5):	THU (TPEh) ±1.377 m ; TVU (TPEv) ±0.164 m
Timestamp:	2008-169.20:52:47.334 (06/17/2008)
Survey Line:	h11846 / 1021_reson8101_hvf / 2008-169 / 903_2052
Profile/Beam:	13/6
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 7.18 fms

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1021_reson8101_hvf/2008-169/903_2052	13/6	0.00	000.0	Primary

Hydrographer Recommendations

Extend 10 fm contour from the east to encompass the 7.18 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

7fm (17328_1, 17320_1, 16016_1, 530_1)

7fm 1ft (531_1)

13.1m (500_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
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Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.13.1

1.14) Profile/Beam - 2085/1 from h11846 / 1101_reson8125_hvf / 2008-151 / 303_1819

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 17.3" N, 135° 09' 34.5" W
Least Depth:	1.67 m (= 5.48 ft = 0.913 fm = 0 fm 5.48 ft)
TPU (±1.96σ):	THU (TPEh) ±1.961 m ; TVU (TPEv) ±0.120 m
Timestamp:	2008-151.18:25:18.524 (05/30/2008)
Survey Line:	h11846 / 1101_reson8125_hvf / 2008-151 / 303_1819
Profile/Beam:	2085/1
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC surveyed b/w charted (17328) 6.5 fm sounding and 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1101_reson8125_hvf/2008-151/303_1819	2085/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

0 3/4fm (17328_1, 17320_1, 16016_1, 530_1)

0fm 5ft (531_1)

1.7m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 2:depth unknown SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 1.669 m VERDAT - 12:Mean lower low water WATLEV - 5:awash



Figure 1.14.1

1.15) Profile/Beam - 4133/235 from h11846 / 1101_reson8125_hvf / 2008-151 / 303_1819

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 33.2" N, 135° 09' 57.9" W
Least Depth:	0.35 m (= 1.15 ft = 0.191 fm = 0 fm 1.15 ft)
TPU (±1.96σ):	THU (TPEh) ±2.128 m ; TVU (TPEv) ±2.993 m
Timestamp:	2008-151.18:32:45.051 (05/30/2008)
Survey Line:	h11846 / 1101_reson8125_hvf / 2008-151 / 303_1819
Profile/Beam:	4133/235
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC surveyed over chd (17328) 1.5 fm sounding

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1101_reson8125_hvf/2008-151/303_1819	4133/235	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17328_1, 17320_1, 16016_1, 530_1)

0fm 1ft (531_1)

.4m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 2:depth unknown SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 0.350 m VERDAT - 12:Mean lower low water WATLEV - 5:awash


Figure 1.15.1

1.16) Profile/Beam - 5964/16 from h11846 / 1101_reson8125_hvf / 2008-151 / 305_1862

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 40' 18.6" N, 135° 08' 31.5" W
Least Depth:	9.98 m (= 32.73 ft = 5.455 fm = 5 fm 2.73 ft)
TPU (±1.96σ):	THU (TPEh) ±1.962 m ; TVU (TPEv) ±0.120 m
Timestamp:	2008-151.20:03:42.231 (05/30/2008)
Survey Line:	h11846 / 1101_reson8125_hvf / 2008-151 / 305_1862
Profile/Beam:	5964/16
Charts Affected:	17326_1, 17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 5.46 fms surveyed 12 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/1101_reson8125_hvf/2008-151/305_1862	5964/16	0.00	000.0	Primary

Hydrographer Recommendations

Move 10 fm contour offshore of 5.46 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

5 ½fm (17326_1, 17328_1, 17320_1, 16016_1, 530_1)

5fm 2ft (531_1)

10.0m (500_1, 50_1)

S-57 Data

Geo object 1:	Sounding	(SOUNDG)
000 00 jeet 11	Doanang	(000100)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.16.1

1.17) Profile/Beam - 760/254 from h11846 / 2802_reson7125_hf_512beams / 2008-162 / 696_2141

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 39' 59.6" N, 135° 12' 11.6" W
Least Depth:	10.90 m (= 35.75 ft = 5.958 fm = 5 fm 5.75 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.250 m
Timestamp:	2008-162.21:44:19.102 (06/10/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-162 / 696_2141
Profile/Beam:	760/254
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 5.96 fms surveyed 155 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-162/696_2141	760/254	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

6fm (17328_1, 17320_1, 16016_1, 530_1)

5fm 5ft (531_1)

10.9m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 10.896 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.17.1

1.18) Profile/Beam - 336/283 from h11846 / 2802_reson7125_hf_512beams / 2008-163 / 315_2225

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 50.9" N, 135° 10' 27.3" W
Least Depth:	10.38 m (= 34.05 ft = 5.675 fm = 5 fm 4.05 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.245 m
Timestamp:	2008-163.22:26:17.669 (06/11/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-163 / 315_2225
Profile/Beam:	336/283
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a LD of 5.67 fms surveyed 80 m offshore of chd (17328) islet.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-163/315_2225	336/283	0.00	000.0	Primary

Hydrographer Recommendations

Add/extend 10 fm ctr offshore of 5.67 fm sounding.

Cartographically-Rounded Depth (Affected Charts):

5 ¹/2fm (17328_1, 17320_1, 16016_1, 530_1)

5fm 4ft (531_1)

10.4m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VERDAT - 12:Mean lower low water



Figure 1.18.1

1.19) Profile/Beam - 433/512 from h11846 / 2802_reson7125_hf_512beams / 2008-169 / 376_1825

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 39' 52.5" N, 135° 10' 52.5" W
Least Depth:	2.40 m (= 7.88 ft = 1.313 fm = 1 fm 1.88 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.971 m ; TVU (TPEv) ± 0.155 m
Timestamp:	2008-169.18:26:11.712 (06/17/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-169 / 376_1825
Profile/Beam:	433/512
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 1.31 fms surveyed over chd (17328) 7.5 fm sounding.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-169/376_1825	433/512	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (17328_1, 17320_1, 16016_1, 530_1)

1fm 2ft (531_1)

2.4m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 2:depth unknown SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 2.401 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged

Feature Images 1 25 y

Figure 1.19.1

1.20) Profile/Beam - 141/512 from h11846 / 2802_reson7125_hf_512beams / 2008-169 / 486_1850

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 40' 04.9" N, 135° 11' 12.5" W
Least Depth:	3.26 m (= 10.70 ft = 1.783 fm = 1 fm 4.70 ft)
TPU (±1.96σ):	THU (TPEh) ± 1.971 m ; TVU (TPEv) ± 0.156 m
Timestamp:	2008-169.18:50:56.401 (06/17/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-169 / 486_1850
Profile/Beam:	141/512
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 1.78 fms surveyed 35 m offshore of chd (17328) 10 fm ctr.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-169/486_1850	141/512	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (17328_1, 17320_1, 16016_1, 530_1)

1fm 4ft (531_1)

3.3m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 2:depth unknown SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 3.260 m WATLEV - 3:always under water/submerged



Figure 1.20.1

1.21) Profile/Beam - 516/500 from h11846 / 2802_reson7125_hf_512beams / 2008-169 / 572_1754

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 40' 25.2" N, 135° 10' 27.1" W
Least Depth:	4.59 m (= 15.08 ft = 2.513 fm = 2 fm 3.08 ft)
TPU (±1.96σ):	THU (TPEh) ±1.971 m ; TVU (TPEv) ±0.163 m
Timestamp:	2008-169.17:55:27.574 (06/17/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-169 / 572_1754
Profile/Beam:	516/500
Charts Affected:	17326_1, 17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 2.51 fms surveyed over chd (17328) 4.25 fm sounding.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-169/572_1754	516/500	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

2¹/₂fm (17326_1, 17328_1, 17320_1, 16016_1, 530_1)

2fm 3ft (531_1)

4.6m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 4.595 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



1.22) Profile/Beam - 282/121 from h11846 / 2802_reson7125_hf_512beams / 2008-170 / 121_1710

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 43.1" N, 135° 08' 13.5" W
Least Depth:	2.59 m (= 8.51 ft = 1.418 fm = 1 fm 2.51 ft)
TPU (±1.96σ):	THU (TPEh) $\pm 1.967 \text{ m}$; TVU (TPEv) $\pm 0.186 \text{ m}$
Timestamp:	2008-170.17:11:02.590 (06/18/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-170 / 121_1710
Profile/Beam:	282/121
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 1.42 fms surveyed in the vicinity of chd (17328) 9 fm sounding.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-170/121_1710	282/121	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (17328_1, 17320_1, 16016_1, 530_1)

1fm 2ft (531_1)

2.6m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846 TECSOU - 3:found by multi-beam VALSOU - 2.594 m VERDAT - 12:Mean lower low water WATLEV - 3:always under water/submerged



Figure 1.22.1

1.23) Profile/Beam - 139/3 from h11846 / 2802_reson7125_hf_512beams / 2008-170 / 125_1652

DANGER TO NAVIGATION

Survey Summary

Survey Position:	56° 38' 41.4" N, 135° 10' 09.2" W
Least Depth:	3.89 m (= 12.76 ft = 2.127 fm = 2 fm 0.76 ft)
TPU (±1.96σ):	THU (TPEh) ±1.972 m ; TVU (TPEv) ±0.152 m
Timestamp:	2008-170.16:52:28.894 (06/18/2008)
Survey Line:	h11846 / 2802_reson7125_hf_512beams / 2008-170 / 125_1652
Profile/Beam:	139/3
Charts Affected:	17328_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new UWTROC with a least depth of 2.13 fms surveyed in passage b/w two southernmost charted (17328) Guibert Islets

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11846/2802_reson7125_hf_512beams/2008-170/125_1652	139/3	0.00	000.0	Primary

Hydrographer Recommendations

Chart new UWTROC

Cartographically-Rounded Depth (Affected Charts):

2fm (17328_1, 17320_1, 16016_1, 530_1)

2fm 1ft (531_1)

3.9m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC) Attributes: QUASOU - 1:depth known SORDAT - 20080618 SORIND - US,US,survy,H11846

TECSOU - 3: found by multi-beam

VALSOU - 3.890 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged



Figure 1.23.1



TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 24, 2008

HYDROGRAPHIC BRANCH: Pacific Hydrographic Branch HYDROGRAPHIC PROJECT: OPR-0112-RA-2008 HYDROGRAPHIC SHEET: H11846

LOCALITY: Walker Channel to Necker Bay, Approaches to Sitka, AK TIME PERIOD: May 30 - June 18, 2008

TIDE STATION USED: 945-1600 Sitka, AK

Lat. 57° 3.1'N Long. 135° 20.5' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

REMARKS: RECOMMENDED ZONING

Please use the TCARI grid "O112RA2008P-TCARI.tc" submitted with the project instructions as the final grid for project OPR-0112-RA-2008, H11846 during the time period between May 30 - June 18, 2008.

Refer to attachments for zoning information.

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



Digitally signed by Peter J. Stone DN: cn=Peter J. Stone, o=CO-OPS, stone@noaa.gov, c=US Date: 2008.06.30 15:49:33 -04'00'

CHIEF, PRODUCT AND SERVICES DIVISION





H11846 HCell Report

Peter Holmberg, Cartographer 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 scale ENCs and RNCs in the region: NOAA RNCs, 17326 (1:40,000), and 17328 (1:40,000), and corresponding NOAA ENCs, US5AK3GM, and US5AK3SM. (See section 4. Meta Areas.)

In addition to one lidar survey H11846 also contains a large area of multibeam data from H11586. The remaining portion of data from H11586 extends far off shore and will be compiled as a separate HCell (see figure 1 in section 4).

HCell compilation of survey H11846 utilized Office of Coast Survey DRAFT HCell Specifications Version 4.0. For additional information on the standards and protocols used for HCell Compilation, see the DRAFT A/PHB HCell Reference Guide, version 2.0, 22 February, 2010.

1. Compilation Scale

Depths and features for HCell H11846 were compiled to the largest scale chart in the region, 17328, 1:40,000. Chart 17326 covers a portion of H11846 as well, however it is also a 1:40,000 scale chart.

2. Soundings

Survey-scale sounding (SOUNDG) feature object layers were built from three separate surfaces. A 4-meter surface H11846.csar, a 10-meter surface H11586.csar, and a 3-meter surface H11540.csar from the lidar survey. From all surfaces 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	3
10	20	4
20	50	4.5
50	300	5

Soundings from multibeam and lidar surfaces were generated separately in order to accurately attribute their TECSOU, SORDAT, and SORIND. As a result of generating separate sounding sets from partially overlapping surfaces some overlap of soundings can be seen in the survey scale sounding set.

In CARIS BASE Editor soundings were manually selected from the high density sounding layers and imported into a new layer created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

3. Depth 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 17326	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 H11409_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
20	36.576	37.9476	20.750	20
50	91.44	92.812	50.750	50

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.

Some modifications made to GC shoreline MLLW contours, to bring the GC shoreline into agreement with H11846 hydrography, necessitated inclusion of several "0" DEPCNT features in the HCell. These 0 value contours have been generalized per the chart above. See 9.2 *Conflicts between Shoreline and Hydrography*.

4. Meta Areas

The following Meta object areas are included in HCell H11846:

M_QUAL

Due to the fact that data three different surveys were used in the compilation of H11846, and the varied topography of the area there are 30 separate M_QUAL objects (see figure 1). Through correspondence with MCD it was agreed that a single \$AREAS polygon object be included in the HCell to aide in application of the HCell (see section 6).

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



Figure 1. Data sources for H11846

5. Features

5.1 Generalization of Features to Chart Scale

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 is modified to emulate chart scale.

Feature generalization to emulate chart scale is accomplished primarily through reduction in the number of features included in the HCell, and in some cases generalizing area features to point objects. Some instances of reduction of area features to point objects is entrusted to the RNC division, for example rocky seabed areas that will display as point features on the RNC. Where line and area objects are included in the HCell, complexity of the lines and edges comprising the features have been smoothed to commensurate with chart scale.

5.2 Compilation of Features to the HCell

Shoreline features for H11846 were delivered from the field in four different hob files defining new features, modification to GC or charted features, and disprovals. These were deconflicted against GC shoreline, the chart and hydrography during office processing.

During office processing, several submerged rocks, and numerous rocky seabeds were digitized from the high resolution BASE Surfaces.

The source of all features included in the H11846 HCell can be determined by the SORIND field.

5.2 Mean High Water Used for HCells

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

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$AREAS	Single polygon covering survey extents
\$CSYMB	Blue Notes
COALNE	Modified GC coastline
DEPCNT	Modified GC MLLW
LNDARE	Islands and islets retained from the chart
LNDELV	Elevations of islets and islands
M_QUAL	Data quality Meta objects
SBDARE	Ledges and reefs, bottom samples, and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features
WATTUR	Breakers
WEDKLP	New and retained kelp areas

The *_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 *_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. By agreement with MCD, the NINFOM field is populated with an abbreviated version of the Blue Note (30 characters or less), describing the chart disposition, to be used by MCD in generating their Chart History spreadsheet.

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

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

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

BASE Editor and S-57 Composer Units:

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

Conversion to charting units and application of NOAA rounding is completed in the same step, at the end of the HCell compilation process.

Conversion to fathoms and feet charting units with NOAA rounding ensures that:

- All depths deeper or equal to 11 fathoms display as whole fathoms.
- All depth units between 0 fathoms (MLLW) and 11 fathoms display as fathoms and whole feet.
- All depth units above 0 fathoms (MLLW) to 2.0 feet above MHW display in feet for values that round to 5 feet or less, and in fathoms and feet above that. (This is a deviation from the traditional 'fathoms and feet' charting rule that requires that all depths above MLLW will be shown in feet. The display in fathoms and feet for depths between MLLW and 2 feet above MHW accommodates S-57 rules that require the same charting units to be used for all depth units (DUNI) in an ENC.)
- All height units (HUNI) which have been converted to charting units, and that are 2.00 feet above MHW and greater, are shown in feet.

In an ENC viewer fathoms and feet depth units (DUNI) display in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. In an ENC viewer, heights (HUNI) display as whole feet.

9. Data Processing Notes

9.1 Junction with H11846

H11846 junctions with H11845, H11679, and H11586. An effort was made among compilers to pick soundings appropriately at adjoining edges between the five surveys during the compilation processes. However there are a few soundings on junctioning surveys that that have already been submitted should be removed due to adjacent shoaler soundings selected from H11846. Blue

notes submitted with H11846 mark the positions and contain recommendations of which soundings to remove from adjoining surveys.

9.2 Conflicts between Shoreline and Hydrography

There are numerous instances of GC shoreline in conflict with hydrography. These were examined using the highest resolution Surfaces. CARIS HIPS and Google Earth were also used to resolve ambiguities in some cases. Many of the conflicts were determined to result from overhanging vegetation in the steep nearshore terrain. Conflicts were resolved by either rejecting the hydrography and adjusting the survey limits accordingly, or by making modifications to the GC shoreline. Approximately 45 adjustments were made to COALNE, DEPCNT (MLLW) and SBDARE (ledge) line objects. These objects are outside the M_QUAL area, but included in the HCell.

10. QA/QC and ENC Validation Checks

H11846 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

H11846_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H11846_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H11846_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11846_outline.gml	Survey outline to populate SURDEX

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	Independent inspection of final HCells using a
Ver.1.0.0.3	COTS viewer.

12. Contacts

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

Peter Holmberg Physical Scientist Pacific Hydrographic Branch Seattle, WA 206-526-6843 peter.holmberg@noaa.gov.

APPROVAL SHEET H11846

Initial Approvals:

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

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or 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.