

H11849

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey

Field No. RA-10-06-08

Registry No. H11849

LOCALITY

State Alaska

General Locality West of Prince of Wales Island

Sublocality Portillo Channel to San Christoval Channel

2008

CHIEF OF PARTY

Commander Donald W. Haines, NOAA

LIBRARY & ARCHIVES

DATE

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HYDROGRAPHIC TITLE SHEET		REGISTRY No H11849
INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.		FIELD No: RA-10-06-08
State <u>Alaska</u>		
General Locality <u>West of Prince of Wales Island</u>		
Sub-Locality <u>Portillo Channel to San Christoval Channel</u>		
Scale <u>1:10,000</u>		Date of Survey <u>May 16 to June 16, 2008</u>
Instructions dated <u>3/18/2005</u>		Project No. <u>OPR-O190-RA-08</u>
Vessel <u>RA1 (1101), RA3 (1021), RA4 (2801), RA5 (2802)</u>		
Chief of party <u>Commander Donald W. Haines, NOAA</u>		
Surveyed by <u>RAINIER Personnel</u>		
Soundings by <u>Reson SeaBat 8101 and 7125, Knudsen 320M</u>		
SAR by <u>F. Ortiz</u>		Compilation by <u>Kurt Brown</u>
Soundings compiled in <u>Fathoms</u>		
REMARKS: <u>All times are UTC. UTM Projection 08</u>		
<u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS)</u>		
<u>naautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were</u>		
<u>generated during office processing. Page numbering may be interrupted or non sequential.</u>		

Descriptive Report to Accompany Hydrographic Survey H11849

Project OPR-O190-RA-08
West of Prince of Wales Island
Portillo Channel to San Christoval Channel, Alaska
Scale 1:10,000
May - June 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-O190-RA-08 dated April 9, 2008 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is West of Prince of Wales Island, Portillo Channel to San Christoval Channel. This survey corresponds to sheet “H” in the sheet layout provided with the Letter Instructions. OPR-O190-RA-08 responds to a request from the National Ocean Service (NOS) for the purpose of updating nautical charts. This project lies in the critical survey area of the NOAA Hydrographic Survey Priorities (NHSP). See Figure 1 for survey area.

With the exceptions noted in this report, complete multibeam echosounder (MBES) coverage was acquired in the survey area. The inshore limit of hydrography was the farthest offshore of the following: (1) the assigned lidar limit line, (2) the 4-meter depth contour, or (3) 32-meters from shore. Total mileage acquired by each vessel and system is referenced in Table 1.

Limited Shoreline Verification was performed for the survey area in addition to lidar shoreline items selected by Tenix LADS for further investigation.

Data Acquisition Type	Hull Number with Mileage (nm)				Total
	1101	1021	2801	2802	
MBES (mainscheme)	-	69.42	84.28	54.06	207.76
Crosslines	-	-	15.3	-	15.3
Holiday and Developments	5.26	-	-	-	5.26
Total Number of Items Investigated	-	-	-	-	36
Total Area Surveyed (sq. nm)	-	-	-	-	7.806

Table 1: Survey Statistics for H11849

Data acquisition was conducted from May 16 to June 16, 2008 (DN 137 to 168).

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

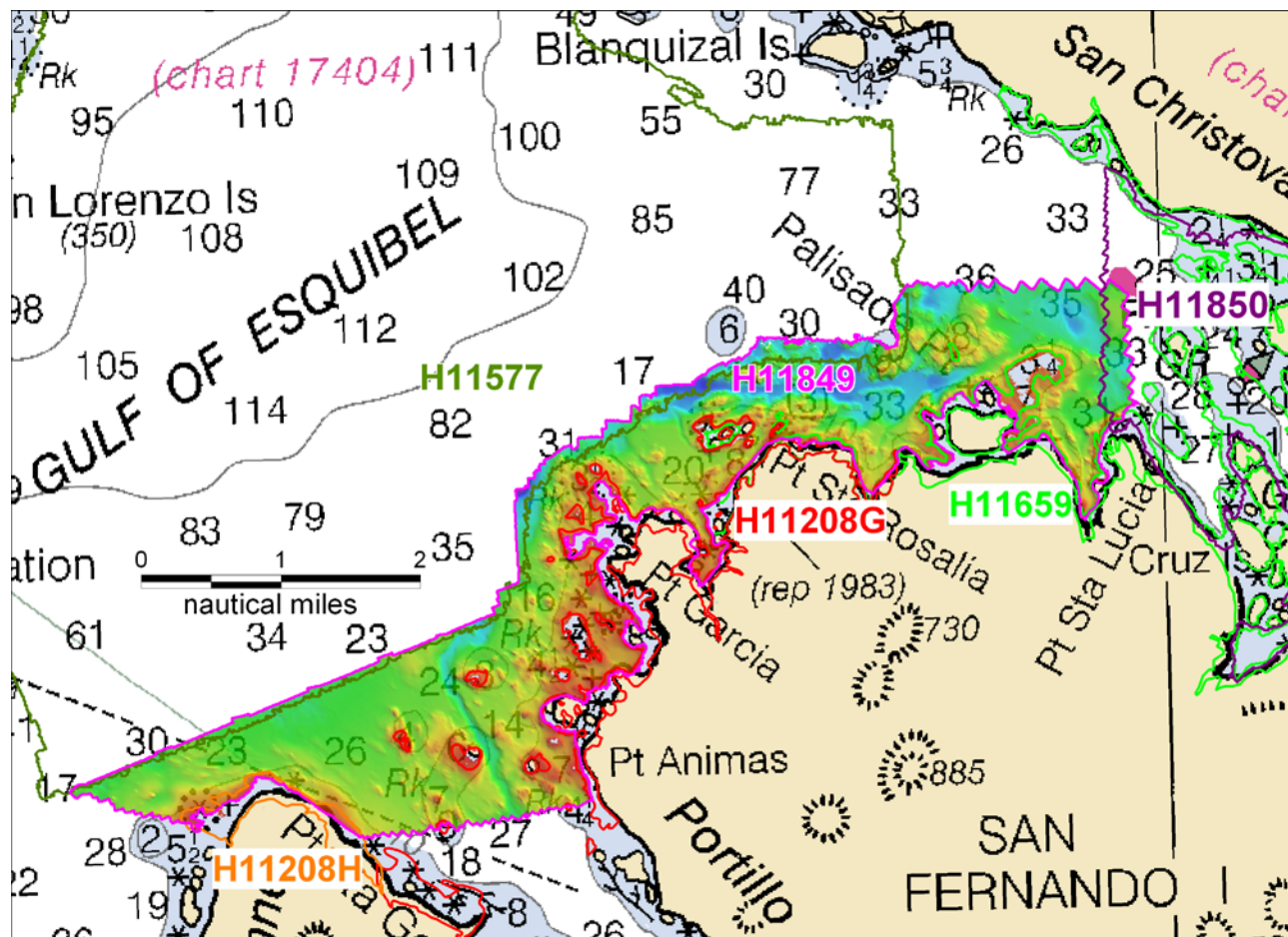


Figure 1: H11849 Survey Limits and junctions (Chart 17400).

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-O190-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
2801	RA-4	Multibeam Echosounder
2802	RA-5	Multibeam Echosounder

Table 2. Data acquisition vessels utilized on H11849.

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

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Multi-Beam Echosounder (MBES) crosslines totaled 15.3 nautical miles, comprising 6.7% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the crosslines CARIS subset mode and agreed well with differences averaging approximately 0.1 meter and not exceeding 0.3 meter.²

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 H11849³ (See Figure 1):

Registry #	Scale	Date	Junction side
H11850	1:10,000	2008	East
H11577	1:10,000	2006	North
H11208H	1:10,000	2004	South (west)
H11208G	1:10,000	2004	South (central)
H11659	1:10,000	2007	South (east)

Survey H11850 was completed concurrently with survey H11849 during project OPR-O190-RA-08. Survey data was compared in CARIS subset mode and agreed well with differences less than 0.3 meters.⁴

Survey H11577 was completed by FAIRWEATHER in 2006 and junctioned with H11849 by comparing BASE surfaces in CARIS HIPS. The surveys agreed well with differences averaging approximately 0.2 meters and not exceeding 0.7 meters. The larger offsets appear to be primarily found in the extreme outer beams of the multibeam in H11577.⁵ The multibeam outer beams of H11849 were rejected in a more conservative manner minimizing this outer beam flutter.

Survey H11208H, a Tenix LADS lidar survey, was junctioned with H11849 by comparing BASE surfaces in CARIS HIPS. In places the surfaces agreed, but typically H11849 was 0.2 to 0.3 meters shoaler than the lidar data. In a few spots H11849 was 0.5 meters shoaler.⁶ This difference could in part be due to comparing a 4m resolution lidar surface to the final combined H11849 surface derived from a 1m resolution surface in this depth range.

Survey H11208G, a Tenix LADS lidar survey, was junctioned with H11849 by comparing BASE surfaces in CARIS HIPS. In places the surfaces agreed, but typically H11849 was 0.2 to 0.4 meters

shoaler than the lidar data. In a few spots H11849 was 0.8 meters shoaler.⁷ The shoaler H11849 surface is even seen in areas with a flat and smooth bottom (see fig #2). This difference could in part be due to comparing a 4m resolution lidar surface to the final combined H11849 surface derived from a 1m resolution surface in this depth range.

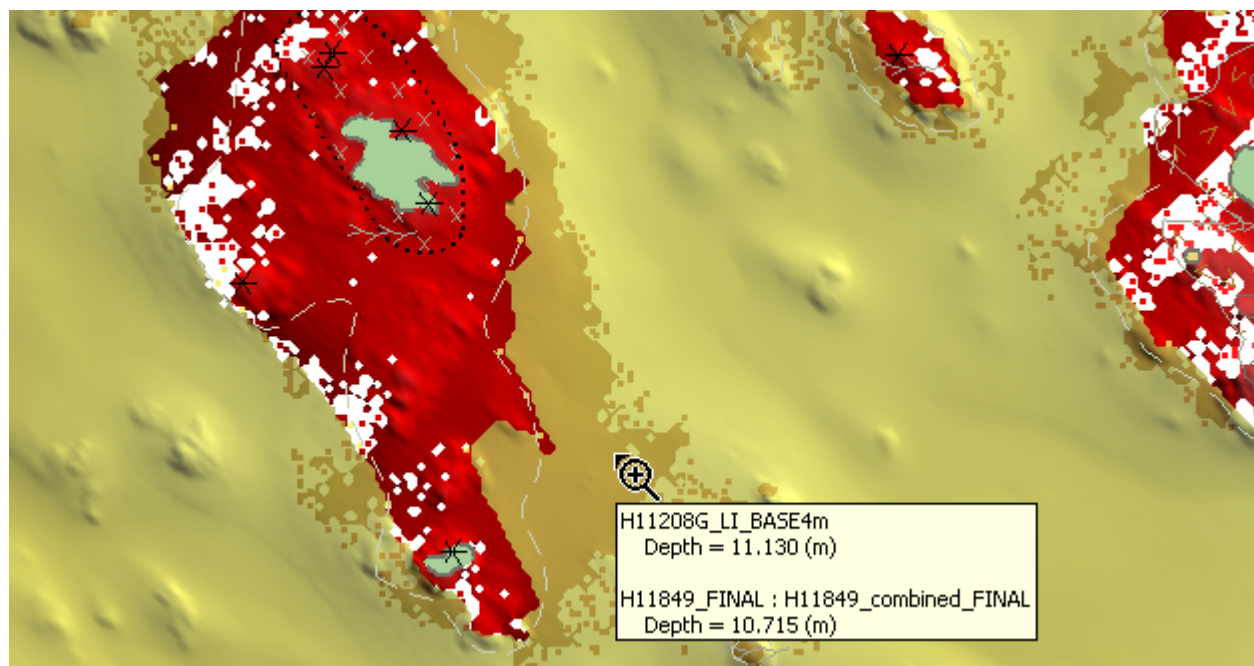


Figure 2: H11849 and H11208G lidar compared in a “flat” area.

Survey H11659, a Tenix LADS lidar survey, was junctioned with H11849 by comparing BASE surfaces in CARIS HIPS. In places the surfaces agreed but typically H11849 was 0.1 to 0.3 meters shoaler than the lidar data. In a few spots, particularly on slopes, H11849 was up to 0.5 meters shoaler.⁸ Differences between BASE surfaces in areas with a flat bottom were generally within 0.1 meters, closer than that seen in survey H11208G.

Data Quality Factors

Data Gaps

The only holidays of any note found in H11849 exist along the junctions with the lidar surveys (H11208H, H11208G, and H11659). Many of these holidays are thin bands of sparse coverage parallel to shore and were due to extensive kelp and foul areas throughout the near-shore survey area. A few of these gaps can also be found around submerged offshore rocks that were also surrounded by kelp (see fig #3). These areas of kelp are well represented in the supplied Composite Source files and should be charted as foul with kelp as indicated.⁹

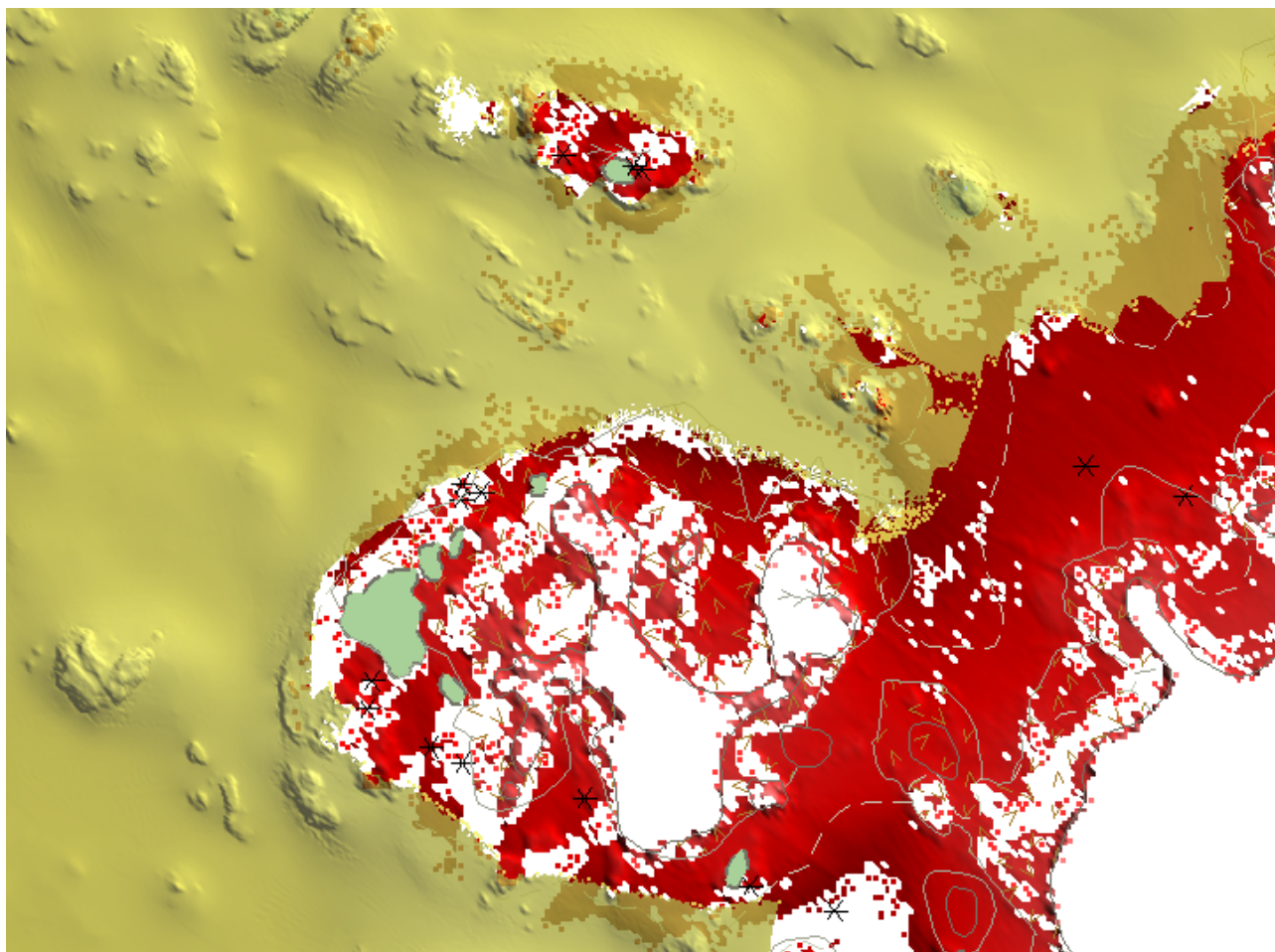


Figure 3: An example of data gaps due to kelp both alongshore and around an offshore rock. The H11849 BASE surface is mustard colored while the lidar coverage is red.

Data gaps between H11849 and the lidar surveys also exist in a few of the small coves found on northern San Fernando Island. Many of these gaps are due to the difficulty in maneuvering a survey launch in these tight quarters but some were simply missed during line planning. The most egregious example of this occurs in an unnamed cove just west of Point San Pasqual (see fig #4). The largest gap seen is ~175 meters long and 60 meters wide at the thickest part.¹⁰

More coverage gaps can be found north of Point Santa Lucia and in the small cove just to the west of the point.¹¹ To the north of the point is a 70x30 meter hole in the lidar coverage that was not filled in with coverage from H11849 (see fig #5). Fortunately, a generous overlap with junction survey H11850 to the east filled in most of this holiday.¹²

At the head of the small cove west of Point Santa Lucia is a good example of a holiday due to the difficulty maneuvering survey launches in tight and shallow quarters (see fig #5). The small point of land on the western shore extending to the southeast in addition to the associated kelp off of this point made data collection behind the point very difficult. Although a launch might be able to enter this gap head on, there would be no room at the end to turn around.

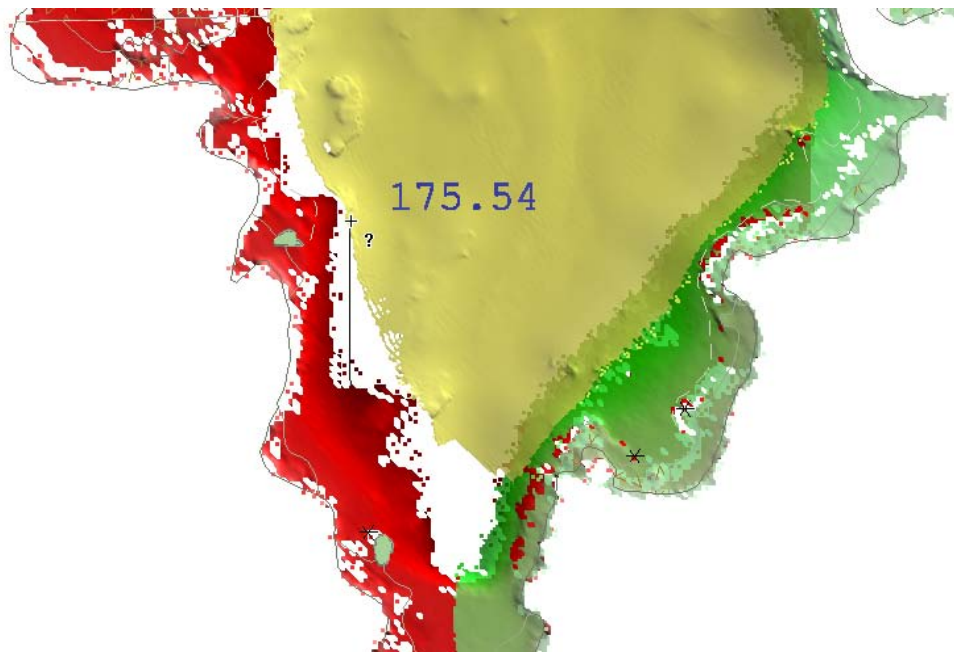


Figure 4: An example of data gaps in an unnamed cove just west of Point San Pasqual. The H11849 BASE surface is mustard colored while the lidar coverage is red and green.

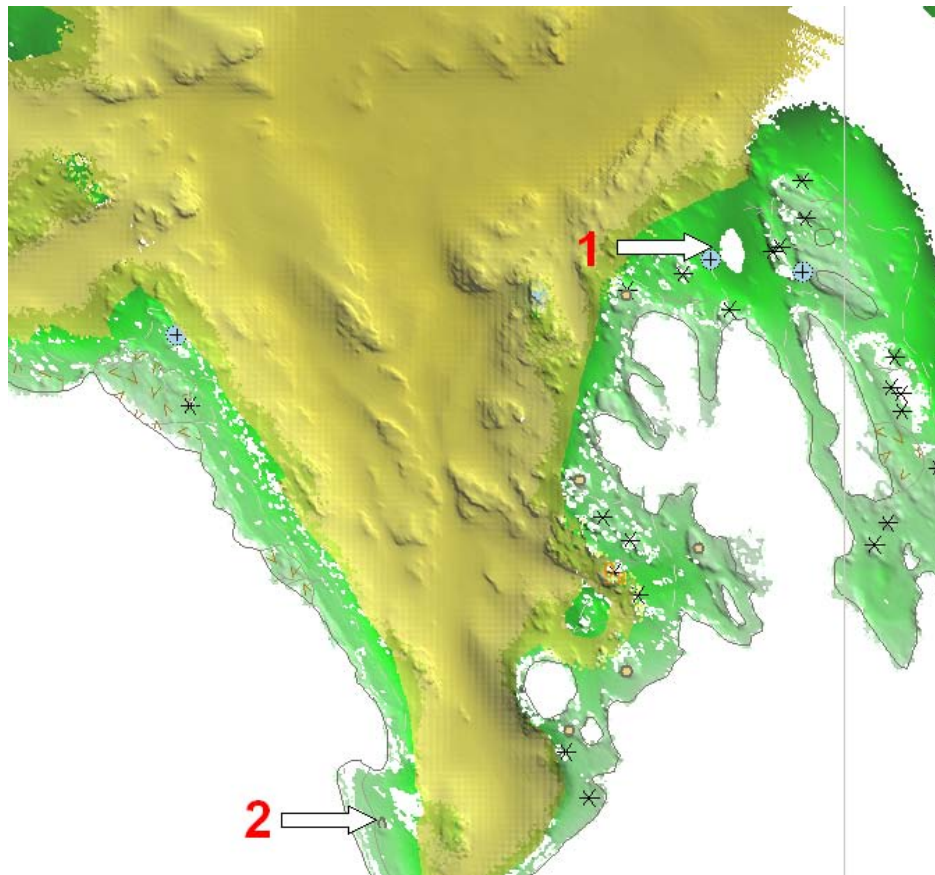


Figure 5: Holidays in an unnamed cove just west of Point Santa Lucia. Gap #1 was covered by junction survey H11850. Gap #2 is a good example of launch maneuvering difficulties causing a data gap. The H11849 BASE surface is mustard colored while the lidar coverage is green.

B3. Data Reduction

Data reduction procedures for survey H11849 conform to those detailed in the *OPR-O190-RA-08 DAPR*. In deep water areas where outer beam noise was high, filters were applied to reject using distance off line. Filtering by this method cleaned up most of the outer beam flutter while ensuring adequate data overlap between adjacent lines.

B4. Data Representation

Many BASE surfaces were used in processing H11849. Final BASE surface resolutions and depth ranges were set to most accurately represent the seafloor, with field sheets smaller than 120×10^6 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 Figures 6 and 7.

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.

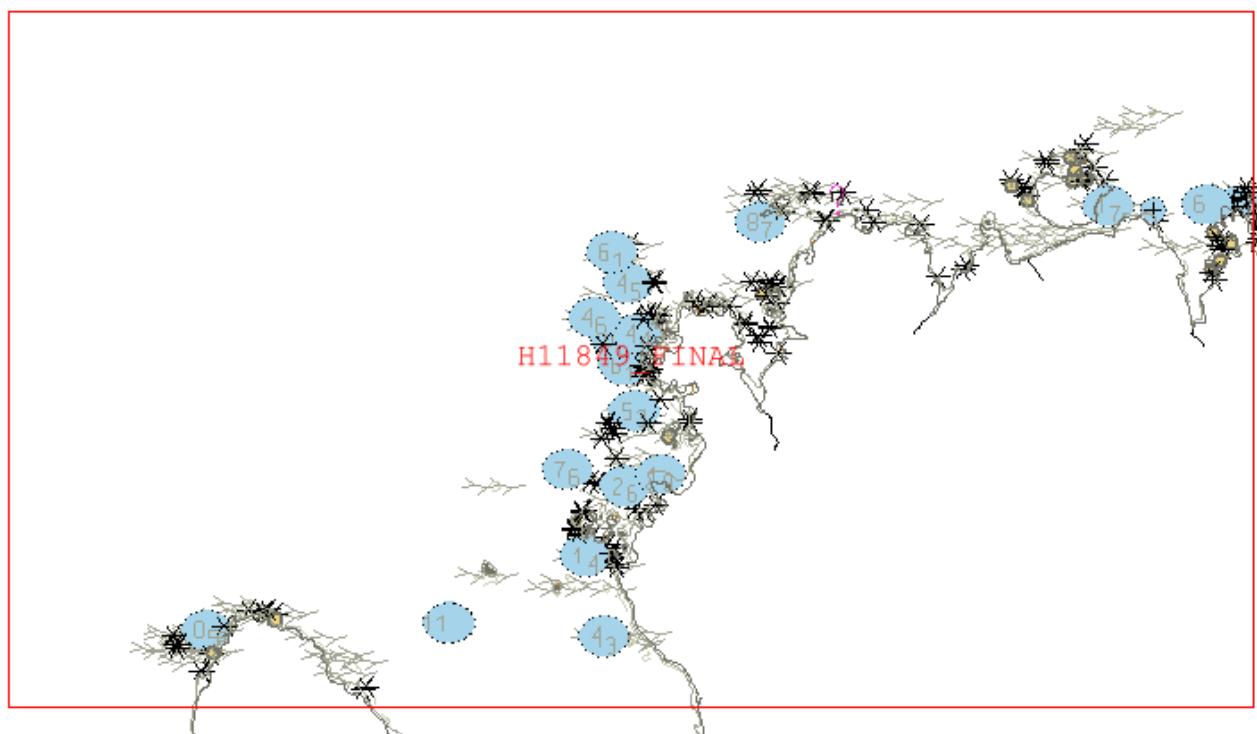


Figure 6: Layout of field sheets for H11849.

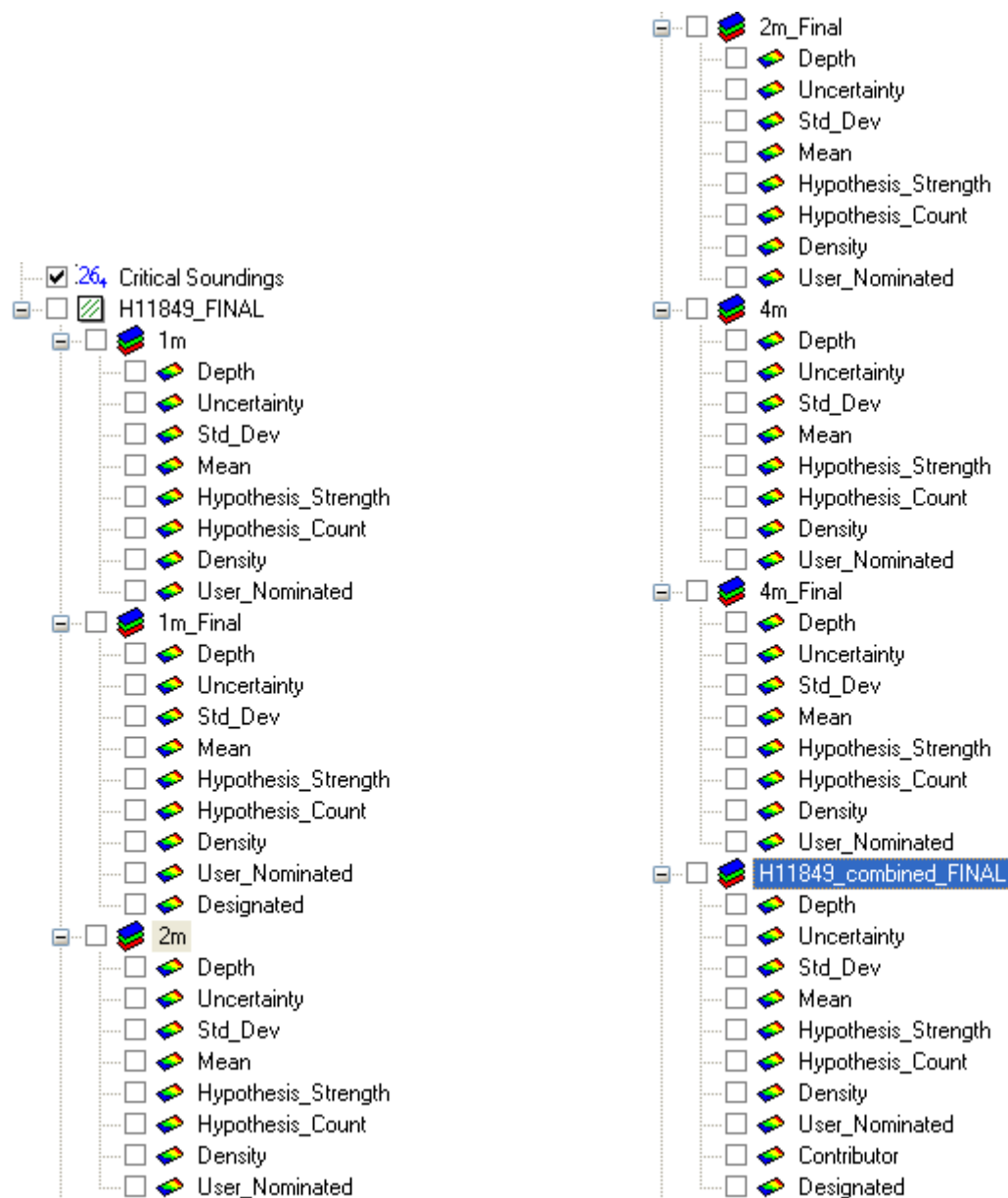


Figure 7: Field sheets and BASE surfaces submitted with H11849.

C. VERTICAL AND HORIZONTAL CONTROL

Project OPR-O190-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 3.

Location	Frequency	Operator	Distance	Priority
Level Island	295 kHz	USCG	58 nm	Primary
Biorka Island	305 kHz	USCG	105 nm	Backup

Table 3: Differential Corrector Sources for H11849.

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 H11849.

No tertiary gauges were required.

All data were reduced to MLLW using final approved water levels from station Sitka, AK (945-1600) using the tide file 9451600.tid and final time and height correctors using the zone corrector file O190RA2008CORP.zdf.

The request for Final Approved Water Levels for H11849 was submitted to CO-OPS on June 19, 2008 and the Final Tide Note was received on July 2, 2008. This documentation is included in Appendix IV.¹³

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

A chart comparison was performed for each of the raster charts assigned in the project instructions for OPR-O190-RA-08, as well as the provided composite source file. No ENC comparisons were performed for survey H11849.

Survey H11849 was compared with the following charts¹⁴:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
17400	1: 229,376	17 th Edition March 2007	03/08/2008
17404	1:40,000	13 th Edition May 2006	03/08/2008
17406	1:40,000	7 th Edition February 2004	06/07/2008

Table 4: Charts compared with H11849

Chart 17400

The scale of Chart 17400 is such that only a cursory comparison was made with survey H11849. 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. For the most part charted depths show good agreement with soundings from H11849 with two exceptions. A charted 8 fathom sounding in the vicinity of 55°34'57" N 133°22'31" W appears to be positioned ~180 meters northeast of the actual position of the shoal. H11849 also found a 6.9 fathom sounding ~300 meters south of the charted 8

fathom position. This error appears to have occurred during chart compilation since smaller scale charts covering the same area have the 8 fathom sounding positioned properly. The 9 fathom sounding in the vicinity of 55°34'47" N 133°23'30" W also seems to have been shifted ~100 meters north of the shoal's actual position. A more detailed discussion of this shoal may be found in the chart 17404 comparison section.¹⁵

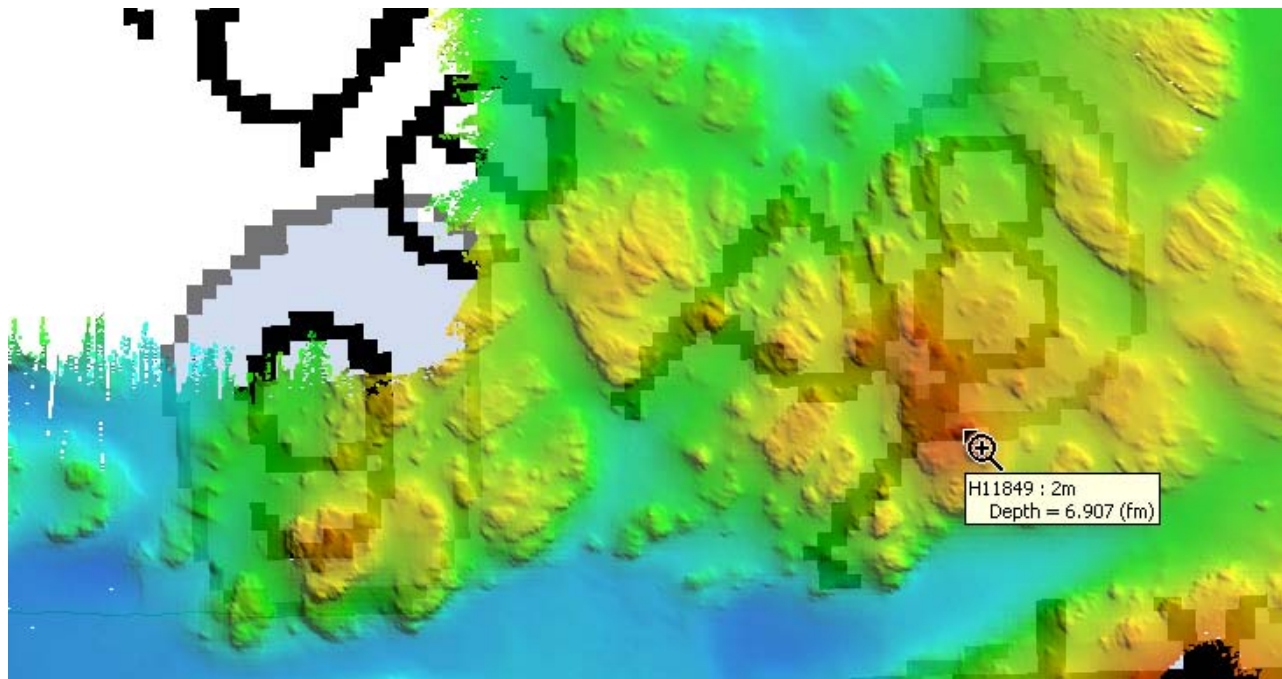


Figure 8: Poorly positioned eight and nine fathom shoals on chart 17400.

Chart 17404

Chart 17404 covers nearly all of survey H11849 with the exception a small area just south of Point Santa Gertrudis in the extreme southwest corner of the survey. For the most part charted depths show good agreement, being less than 1 fathom deeper, than soundings from H11849. H11849 often found shoaler points between charted soundings but this difference can be attributed to 100% SWMB coverage. Exceptions to this are several rogue charted depths in Portillo Channel that are significantly shoaler than H11849 soundings (see table #5). In all cases, these erroneous depths are covered with 100% SWMB. The Hydrographer recommends removing the charted depths and charting as per the digital data.¹⁶

Charted depth	H11849 sounding	Position
3 1/4	18.1	55°31'52" N 133°31'07" W
7 1/2	13.1	55°31'44" N 133°30'28" W
17	24.5	55°32'10" N 133°29'58" W
13	25.1	55°32'02" N 133°29'57" W
17	24.5	55°32'42" N 133°28'54" W

Table 5: A table of suspect charted (17404) depths.

A final discrepancy, previously discussed in the in the chart 17400 comparison section is a charted 9 fathom sounding in the vicinity of 55°34'44" N 133°23'30" W. While the position of the sounding does lie atop a rocky shoal, the least depth found by H11849 was 10.0 fathoms. 100% SWMB covers the entire area.¹⁷

Shoreline Discrepancies

The charted 17404 shoreline displayed a significant offset to both the SWMB data and the supplied composite source file. This shift is by no means consistent or predictable, in some spots the chart appears to be correct while in others a shift of up to a 125 meter north has occurred. A good example of this can be seen near Palisade Island (see fig #9). Palisade Island itself and its associated offshore rocks to the northwest appear to be charted correctly and agree well with both the hydrographic data and composite source file. But immediately to the west at Point San Pasqual, 20 meter depths plot on top of charted land. In this spot, the composite source file shoreline plots 140 meters south of the charted shoreline.¹⁸

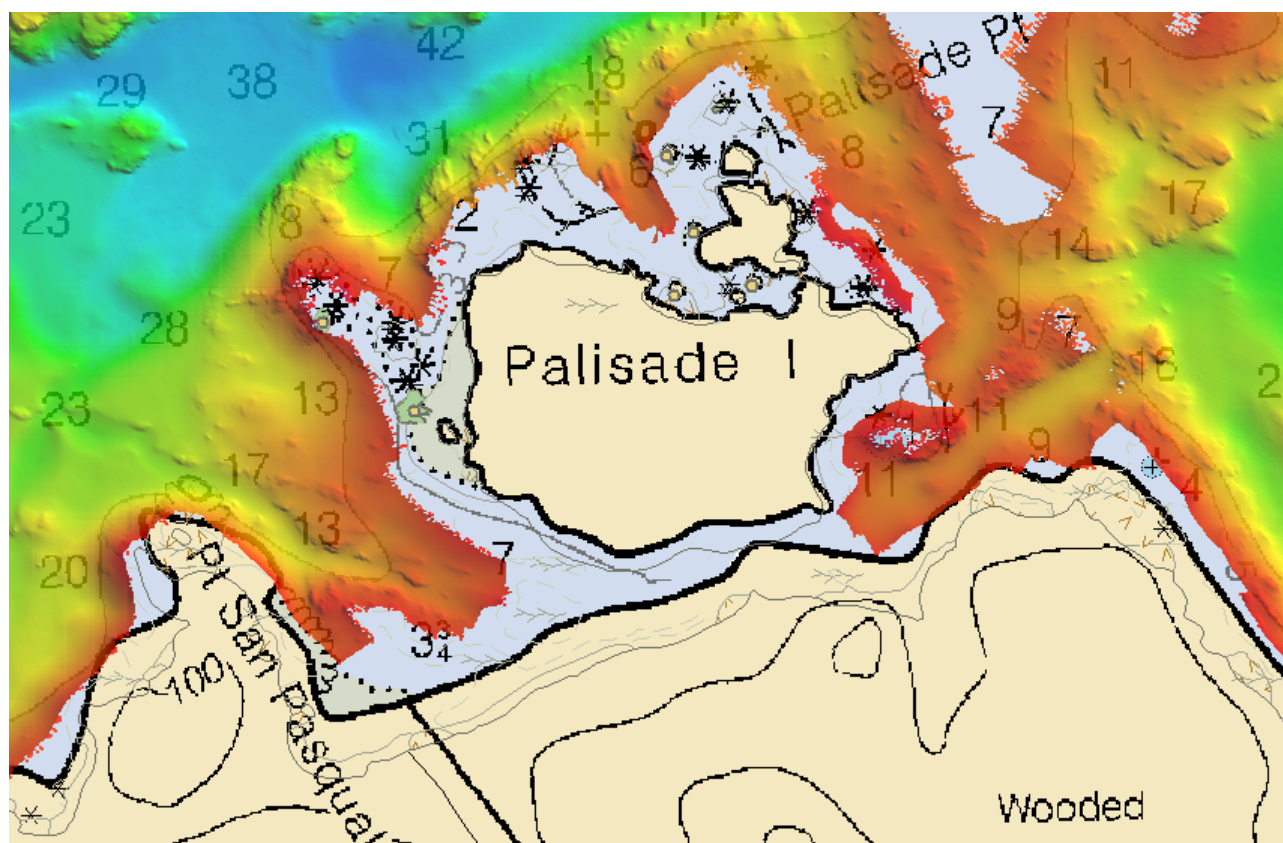


Figure 9: Shoreline discrepancies near Palisade Island on chart 17404.

Numerous charted rocks that were positioned in deep waters outside of the lidar limits were also disproved using SWMB (see fig #10).¹⁹ Descriptions of these disproved rocks may be found included in the Survey Feature Report in Appendix II. Whether or not these incorrectly charted rocks are a result of the previously mentioned shift of charted shoreline is not immediately apparent.

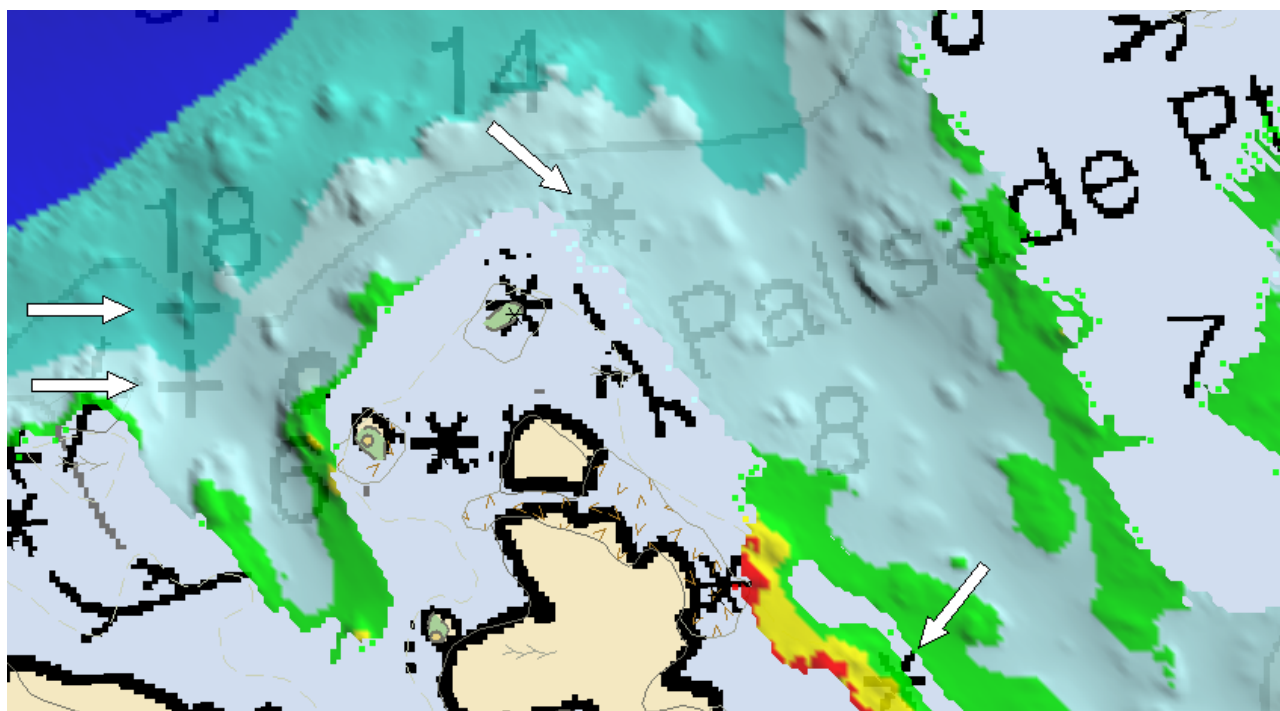


Figure 10: Four charted rock disprovals on chart 17404 north of Palisade Island.

Charts 17406

Chart 17406 covers the southern half of survey H11849 from Point Garcia south. This chart is the same scale as 17404 and all of the soundings appear to be identical in their common area. Since this is the case, chart 17406 also contains the five erroneous charted depths in Portillo Channel previously discussed in the chart 17404 comparison section. Other charted depths show good agreement, being less than 1 fathom deeper, than soundings from H11849.²⁰

A $4\frac{1}{4}$ fathom charted depth just west of Pt Santa Gertrudis in the vicinity of $55^{\circ} 31' 45''$ N $133^{\circ} 31' 49''$ W appears to be in error (see fig #11). This charted depth is covered by complete MBES coverage and lidar but only soundings between 7 and 8 fathoms were observed. This charted $4\frac{1}{4}$ fathom depth should be superseded with soundings from the current survey.²¹

Approximately 120 meters to the southwest of the $4\frac{1}{4}$ fathom sounding discussed in the previous paragraph is a charted $\frac{1}{2}$ fathom rock (see fig #11). Although H11849 shows no indication of this submerged rock with soundings around 6 fathoms, slightly less than half of the rock was covered with SWMB. An examination of the lidar junction reveals that the location of this rock is just outside of H11849's coverage area. Without conclusive SWMB coverage to the contrary, the charted $\frac{1}{2}$ fathom rock should be retained as charted.²²

Unlike chart 17404, the charted 17406 shoreline agrees very well with both the hydrographic data and composite source file.²³

The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area except as noted above.²⁴

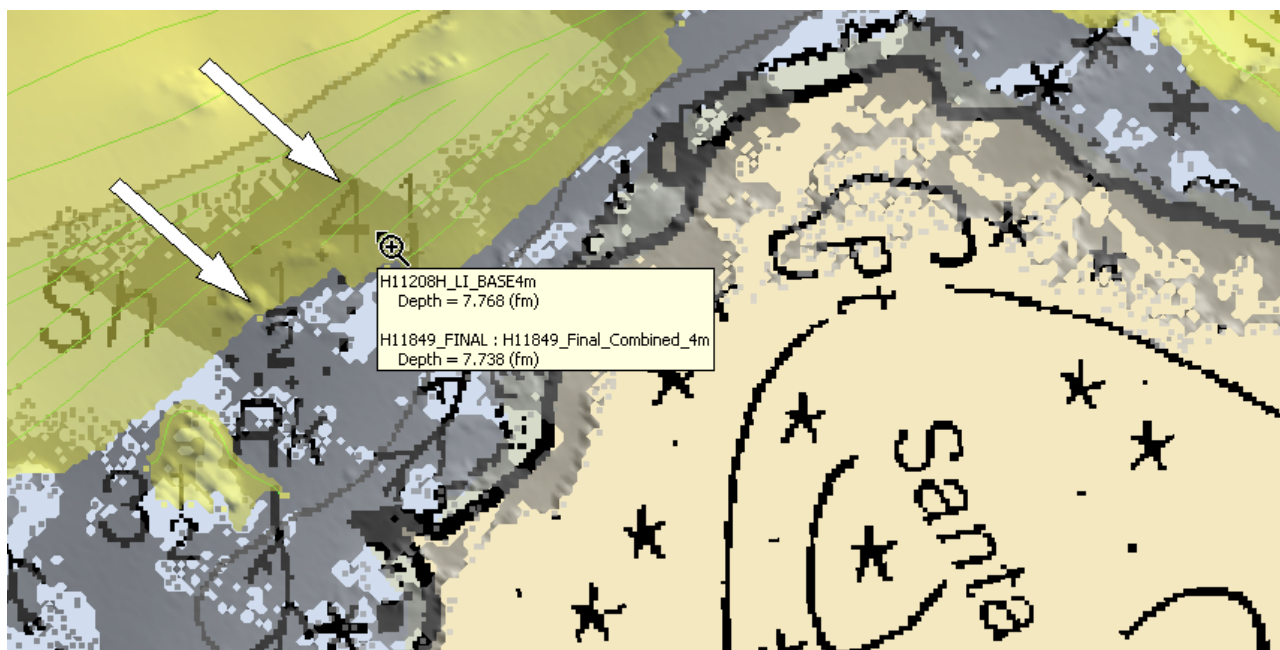


Figure 11: A suspect 4 $\frac{1}{4}$ fathom charted depth and $\frac{1}{2}$ fathom rock just west of Pt Santa Gertrudis on chart 17406. The H11849 BASE surface is mustard colored while the lidar coverage is grey.

D.1.b. Dangers to Navigation

Thirteen (13) Dangers to Navigation (DTONs) were found on survey H11849 and were reported to the Marine Chart Division via email. The DTONs were submitted on July 21, 2008 under the report named "H11849_DTON_Report_DN198". The original DTON submission package is included in Appendix I. Descriptions of each DTON are included in the Survey Feature Report in Appendix II.²⁵

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

One (1) AWOIS items fell the within the survey limits of H11849. This AWOIS item was assigned for full investigation. A description of this AWOIS item investigation is included in the Survey Feature Report in Appendix II.²⁶

Additional Items

Thirty five (35) lidar investigations fell within the survey limits of H11849. The bulk of these items were investigated using the tilted Reson 8125 mounted on 1101 although a few were covered with conventional SWMB. A description of these lidar item investigations is included in the Survey Feature Report in Appendix II.

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.b. Shoreline Verification

Shoreline Source

A composite source S57 file was provided on the project CD. The composite source is comprised of ENC and prior survey features. This composite source was printed on paper “boat sheets” and displayed in Hypack for field verification.

Shoreline Verification

Limited shoreline verification was conducted at the lowest available stage of tide in accordance with FPM Section 3.4.6.1.2. Due to the fact that lidar data had been previously collected along the shoreline and no new offshore rocks were located, survey H11849 collected no Detached Positions (DPs). Near-shore lidar investigations were conducted using the tilted Reson 8125 mounted on 1101 which to an extent could “see” under the kelp and confirm or disprove suspected submerged rocks. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline.

All shoreline data is submitted in Caris Notebook .hob files. The session H11849_Notebook_session.wrk contains the following:

HOB File	Purpose and Contents
H11849_Composite_Source.hob	Original source data filtered to the limits of survey H11849
H11849_Field_Verified.hob	Field verified source features and shoreline, including edits, updates and DPs.
H11849_Deleted_Source.hob	Items removed from the field verified composite source requiring removal from chart

Table 6: List and description of Notebook HOB files.

The *H11849_Field_Verified_Compsource* layer depicts the shoreline as surveyed. The *H11849_Deleted_Source* layer contains all disproved features that should be removed from the chart.

The composite source file showed many near shore areas as kelp areas. During shoreline acquisition kelp was observed in the composite source locations but the area sizes and shapes showed minor variation. Due to the fact that kelp is seasonal and subject to currents, the hydrographer recommends that it be retained as charted.²⁷

Lidar item investigations were imported into Pydro for tracking and de-confliction. High points of submerged rocks were designated in CARIS HIPS and then carried over into Pydro where they were grouped with the appropriate item investigation. Lidar investigation methods and recommendations are described in the Pydro “Remarks” and “Recommendations” tabs.

Source Shoreline Changes and New Features

Items for survey H11849 that require further discussion have been flagged “Report” in Pydro in H11849.pss. Investigation methods and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix I.²⁸

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.²⁹

D.2.c. Aids to Navigation

There are no aids to navigation (ATONs) within the limits of survey H11849.³⁰

D.2.d. Overhead Features

There are no overhead features within the limits of survey H11849.³¹

D.2.e. Submarine Cables and Pipelines

There are no charted submarine cables or pipelines within the limits of survey H11849.³²

D.2.f. Ferry Routes

There are no charted ferry routes within the limits of survey H11849.³³

D.2.g. Bottom Samples

Bottom samples were not performed in survey H11849.³⁴

Revisions Compiled During Office Processing and Certification

¹ Filed with project records

² Concur

³ H11849 junctions with survey H11694 to the north and survey H11577 to the west, both of which have been compiled. A common junction was made with these surveys. H11849 also junctions with survey H11850 which has not been compiled. A common junction was not made with this survey during compilation, so the western extent of H11849 should supersede H11850 in the common area.

⁴ Concur

⁵ Concur

⁶ Concur. In areas with both lidar and SWMB coverage the compiler used SWMB data for sounding selection. In the areas covered only by survey H11208, rocks and soundings were compiled to the HCell using the lidar data. The lidar data was not used to disprove charted features. Charted features in the lidar area were retained.

⁷ Concur

⁸ Concur

⁹ These data gaps were not significant and not shown in the HCell.

¹⁰ Concur. The data gap is shown between the M_QUAL layers.

¹¹ Concur. The data gap is shown between the M_QUAL layers.

¹² Concur with clarification. H11850 covers half of the holiday. As H11850 covers part of the holiday, the compiler chose to end compilation of lidar survey H11659 just to the west of this holiday. The holiday and further areas of H11659 will be compiled with survey H11850.

¹³ See attached Tide Note dated June 27, 2008

¹⁴ H11849 was compared to chart 17404, 14th edition, October 2008 (Notice to Mariners May 1, 2010) and 17406, 7th edition, February, 2004 (Notice to Mariners May 1, 2010).

¹⁵ The latest version of chart 17400 has been corrected.

¹⁶ Concur

¹⁷ Concur

¹⁸ GC shoreline has been applied to the latest edition of chart 17404 resolving these discrepancies.

¹⁹ All items recommended for deletion have been bluenoted in the HCell. The southernmost rock in the image was retained in the HCell as SWMB did not cover the rock.

²⁰ Concur

²¹ Concur

²² Concur

²³ Do not concur. GC shoreline does not appear to have been applied to chart 17406 and discrepancies exist between the ENC and raster.

²⁴ Concur

²⁵ All DTONs have been applied to the chart. See attached DTON report.

²⁶ See attached portion of the feature report which includes the AWOIS item.

²⁷ Concur. Retain all charted kelp areas.

²⁸ The features report is not attached as features described in the H11849 Survey Features Report do not represent a complete listing of features compiled to the HCell. Additional features were added, some removed, and some modified in characterization for depiction at chart scale. A final accounting of features addressed by the survey and/or compiled to the HCell are included as Blue Notes and as NINFOM attributes for all features.

²⁹ Concur with clarification; the delivered files were used in the compilation of the HCell. Chart features per HCell.

³⁰ Concur

³¹ Concur

³² Concur

³³ Concur

³⁴ With the exception of rky symbols, all charted bottom characteristics should be retained.

E. APPROVAL

As Chief of Party, Field operations for hydrographic survey H11849 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 (May 2008 edition), Field Procedures Manual (May 2008 edition), and all HSD Technical Directives issued through May 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-O190-RA-08	July 28, 2008	N/CS34
Coast Pilot Report for OPR- O190-RA-08	<i>will be submitted under separate cover</i>	N/CS26

Approved and Forwarded:



Digitally signed by Donald W. Haines, CDR/NOAA
DN: cn=Donald W. Haines, CDR/NOAA, c=US, o=NOAA/NMAO/
MOC-P, ou=NOAA Ship RAINIER, email=co.rainier@noaa.gov
Reason: I am approving this document
Date: 2008.07.23 08:58:21 -08'00'

Commander Donald W. Haines, NOAA
Commanding Officer

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

Survey Sheet Manager:



Ian Colvert
I am the author of this document
2008.07.23 16:31:13 Z

Ian Colvert
Survey Technician, NOAA Ship RAINIER

Chief Survey Technician:



I have reviewed this document
2008.07.22 15:38:34 -08'00'

James B. Jacobson
Chief Survey Technician, NOAA Ship RAINIER

Field Operations Officer:



I have reviewed this document
2008.07.22 19:05:59 -08'00'

Lieutenant Charles J. Yoos, NOAA
Field Operations Officer

H11849 DTON Report

Registry Number: H11849
State: Alaska
Locality: West of Prince of Wales Island
Sub-locality: Portillo Channel to San Christoval Channel
Project Number: OPR-O190-RA-08
Survey Dates: 05/16/2008 - 06/16/2008

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17405	15th	05/01/2006	1:40,000 (17405_1)	[L]NTM: ?
17404	13th	05/01/2006	1:40,000 (17404_1)	[L]NTM: ?
17406	7th	02/01/2004	1:40,000 (17406_1)	[L]NTM: ?
17400	16th	06/02/2001	1:229,376 (17400_1)	[L]NTM: ?
16016	20th	11/01/2003	1:969,756 (16016_1)	[L]NTM: ?
531	23rd	01/01/2006	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	31st	06/01/2005	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	Sounding	1.37 m	55° 32' 06.4" N	133° 27' 43.9" W	---
1.2	Sounding	4.64 m	55° 33' 35.2" N	133° 27' 34.8" W	---
1.3	Sounding	16.52 m	55° 34' 22.9" N	133° 24' 17.5" W	---
1.4	Sounding	10.86 m	55° 32' 17.5" N	133° 28' 04.9" W	---
1.5	Sounding	4.18 m	55° 32' 40.1" N	133° 27' 08.4" W	---
1.6	Sounding	12.50 m	55° 31' 29.9" N	133° 29' 12.9" W	---
1.7	Sounding	15.27 m	55° 31' 44.4" N	133° 28' 08.6" W	---
1.8	Sounding	14.69 m	55° 32' 09.8" N	133° 28' 26.4" W	---
1.9	Sounding	11.82 m	55° 33' 56.7" N	133° 25' 45.5" W	---

1.10	Sounding	13.00 m	55° 33' 23.8" N	133° 27' 47.8" W	---
1.11	Sounding	15.25 m	55° 34' 07.3" N	133° 23' 38.9" W	---
1.12	Sounding	11.87 m	55° 34' 47.3" N	133° 22' 33.4" W	---
1.13	Sounding	19.30 m	55° 33' 07.1" N	133° 27' 58.5" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 303/234 from h11849 / 1101_reson8125_hvf / 2008-168 / 331_1746

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 32' 06.4" N, 133° 27' 43.9" W
Least Depth: 1.37 m (= 4.48 ft = 0.747 fm = 0 fm 4.48 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.980 m ; **TVU (TPEv)** ± 0.873 m
Timestamp: 2008-168.17:47:32.633 (06/16/2008)
Survey Line: h11849 / 1101_reson8125_hvf / 2008-168 / 331_1746
Profile/Beam: 303/234
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

LIDAR (H11208G) rock with lidar depth of 2.0 m verified - multibeam least depth shows 1.4 meters. SWMB was collected by driving around the patch of kelp using the tilted RESON 8125. The kelp interfered with both the launch and the sonar, resulting in a 50x90 meter gap in coverage. As a result, the shoalest point of the rock may not have been captured.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/1101_reson8125_hvf/2008-168/331_1746	303/234	0.00	000.0	Primary
ChartGPs - ENC H11849_LI_Investigations	Other 3	34.04	046.0	Secondary (grouped)

Hydrographer Recommendations

Chart a submerged rock in the position of the 1.4m covered rock found with SWMB.

Cartographically-Rounded Depth (Affected Charts):

0 $\frac{3}{4}$ fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)
 0fm 4ft (531_1)
 1.4m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20080616
SORIND - US, US, survy, H11849
VALSOU - 1.366 m
WATLEV - 3:always under water/submerged

Feature Images

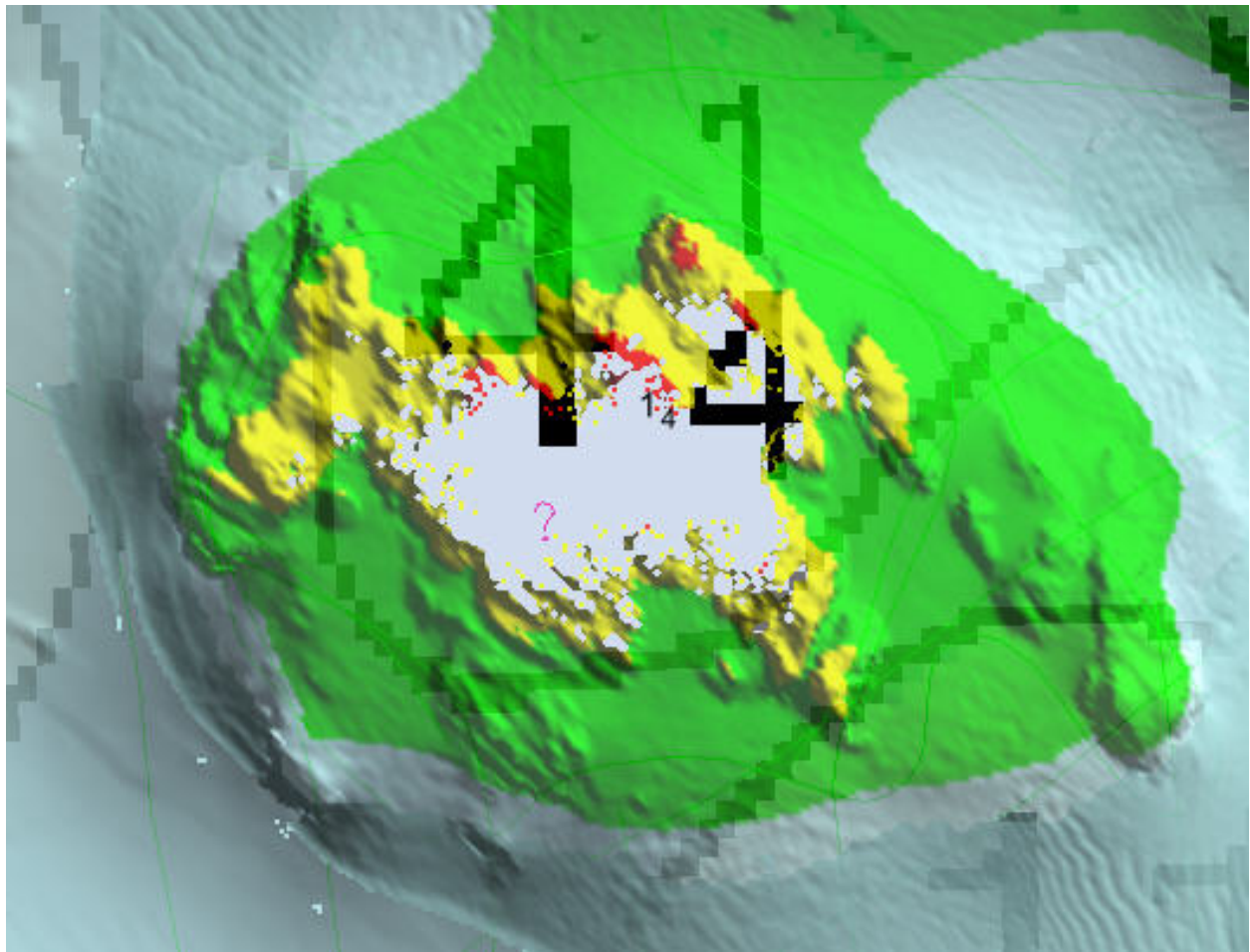
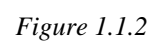


Figure 1.1.1



1.2) Profile/Beam - 437/197 from h11849 / 1101_reson8125_hvf / 2008-168 / 339_1839

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 33' 35.2" N, 133° 27' 34.8" W
Least Depth: 4.64 m (= 15.23 ft = 2.538 fm = 2 fm 3.23 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.965 m ; TVU (TPEv) ± 0.134 m
Timestamp: 2008-168.18:40:22.153 (06/16/2008)
Survey Line: h11849 / 1101_reson8125_hvf / 2008-168 / 339_1839
Profile/Beam: 437/197
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

4.6 meter least depth on submerged rock confirmed with SWMB (lidar depth = 5.1 meters). SWMB was collected by driving around the patch of kelp using the tilted RESON 8125. The kelp caused minor interference with the sonar causing slight gaps in the coverage.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/1101_reson8125_hvf/2008-168/339_1839	437/197	0.00	000.0	Primary
ChartGPs - ENC H11849_LI_Investigations	Danger 16	1.33	159.0	Secondary (grouped)

Hydrographer Recommendations

Chart a submerged rock with depth and position from current survey.

Cartographically-Rounded Depth (Affected Charts):

2 ½fm (17404_1, 17406_1, 17400_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: SORDAT - 20080616
SORIND - US, US, survy, H11849
VALSOU - 4.642 m
WATLEV - 3:always under water/submerged

Feature Images

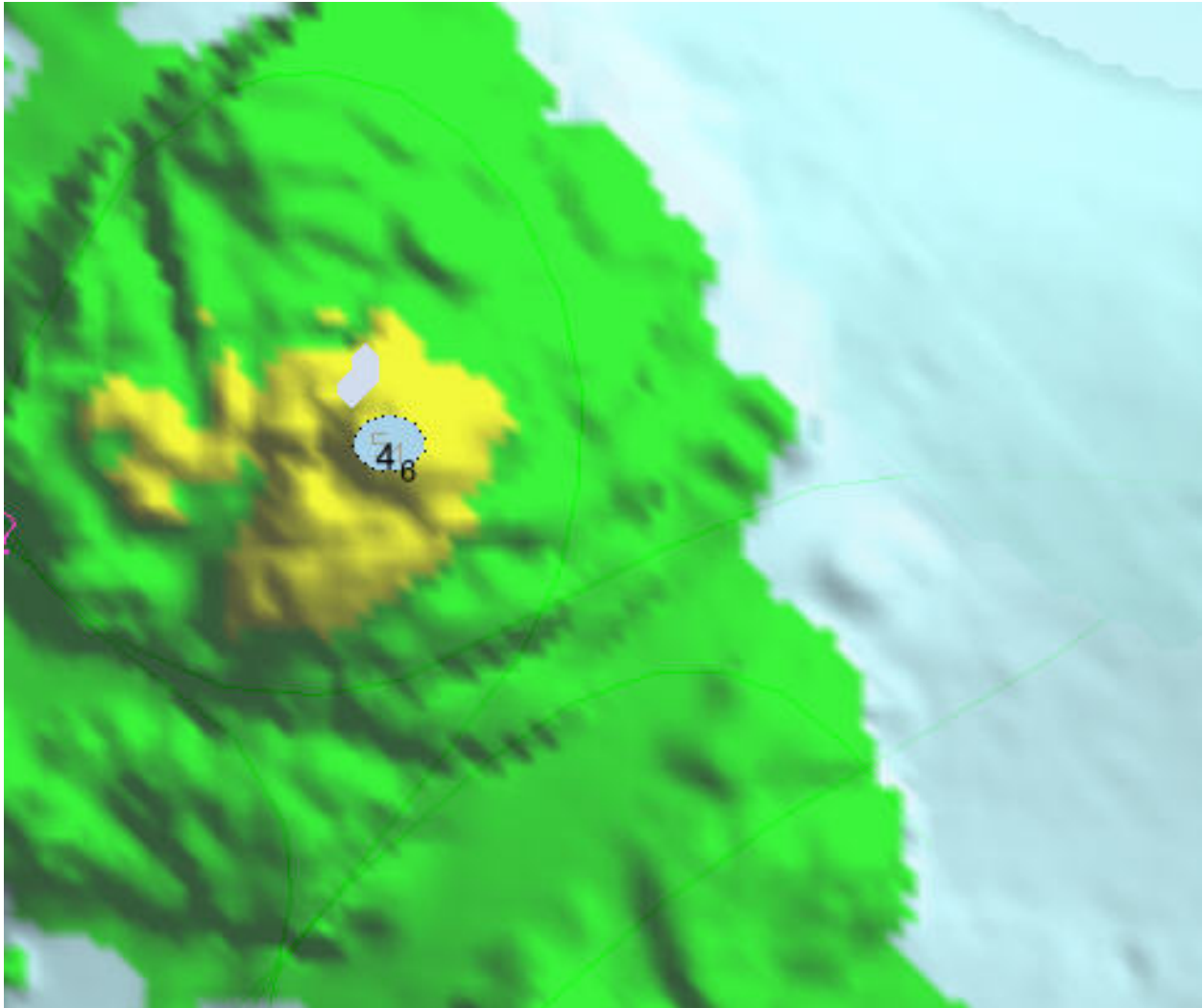


Figure 1.2.1

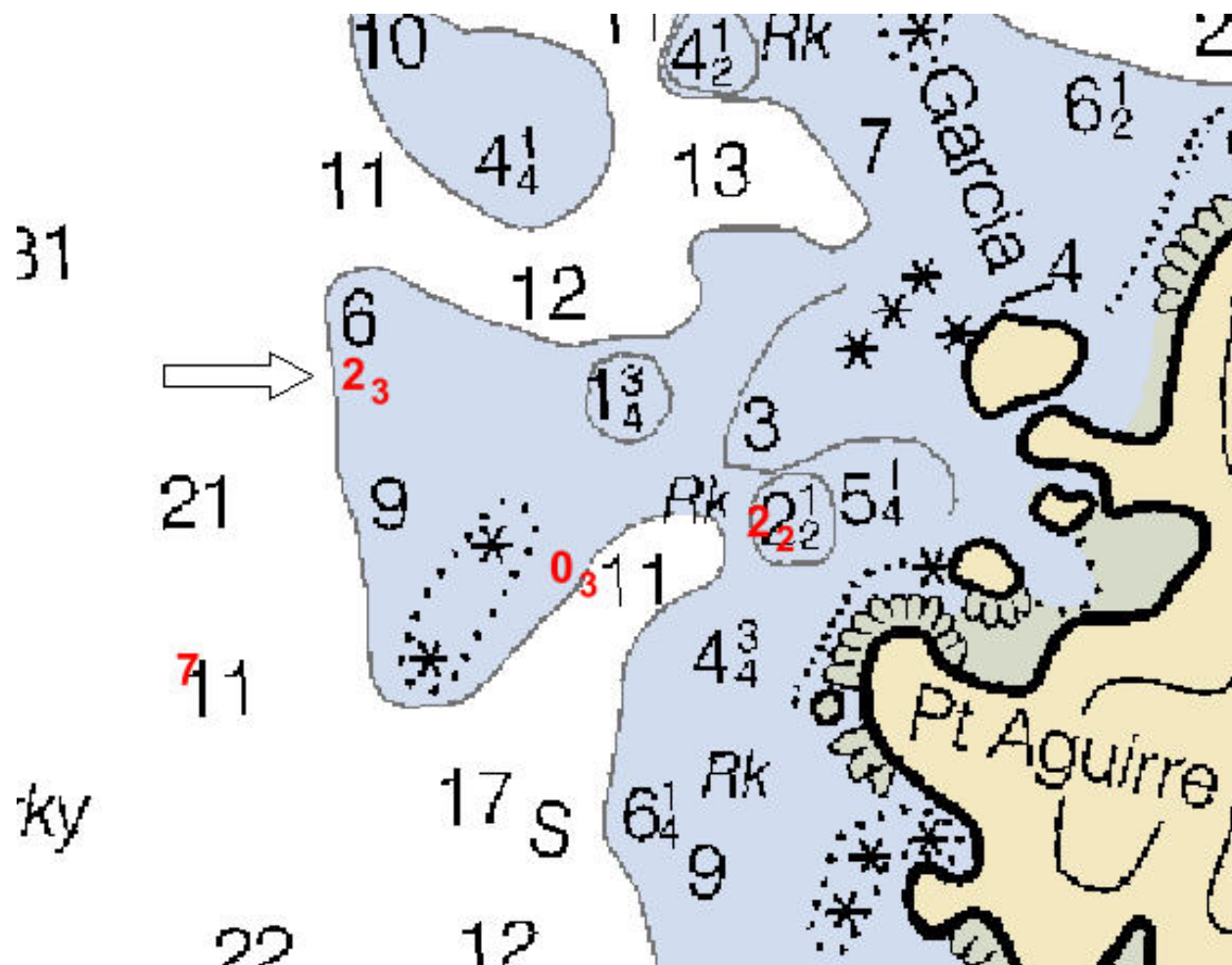


Figure 1.2.2

1.3) Profile/Beam - 3590/5 from h11849 / 1021_reson8101_hvf / 2008-165 / 469_2227

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 34' 22.9" N, 133° 24' 17.5" W
Least Depth: 16.52 m (= 54.20 ft = 9.033 fm = 9 fm 0.20 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.378 m ; **TVU (TPEv)** ± 0.260 m
Timestamp: 2008-165.22:43:01.486 (06/13/2008)
Survey Line: h11849 / 1021_reson8101_hvf / 2008-165 / 469_2227
Profile/Beam: 3590/5
Charts Affected: 17404_1, 17405_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/1021_reson8101_hvf/2008-165/469_2227	3590/5	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

9fm (17404_1, 17405_1, 17400_1, 16016_1, 530_1)

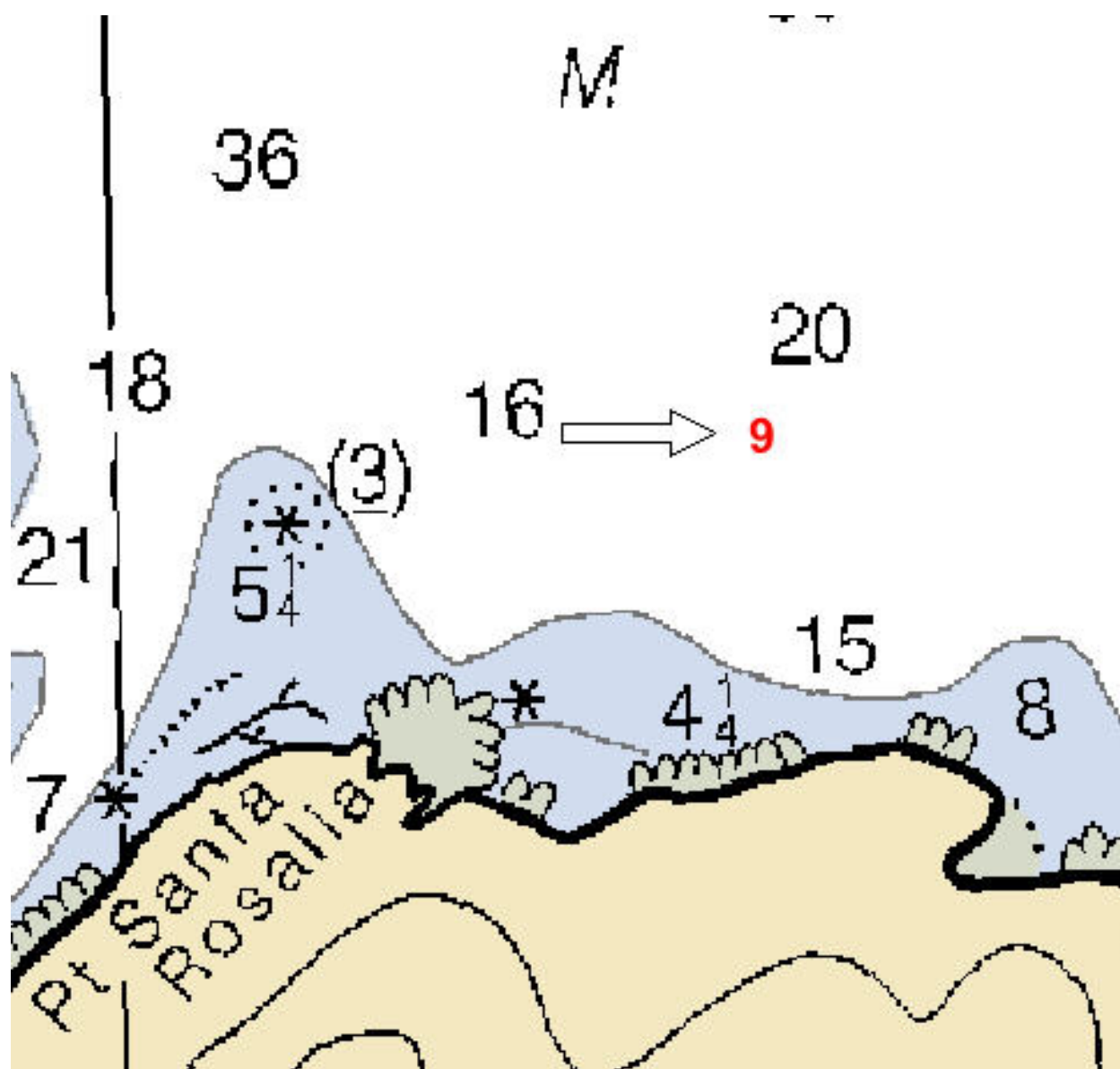
9fm 0ft (531_1)

16.5m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

*Figure 1.3.1*

1.4) Profile/Beam - 281/41 from h11849 / 1021_reson8101_hvf / 2008-166 / 374_2037

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 32' 17.5" N, 133° 28' 04.9" W
Least Depth: 10.86 m (= 35.64 ft = 5.941 fm = 5 fm 5.64 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.377 m ; **TVU (TPEv)** ± 0.162 m
Timestamp: 2008-166.20:38:16.461 (06/14/2008)
Survey Line: h11849 / 1021_reson8101_hvf / 2008-166 / 374_2037
Profile/Beam: 281/41
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/1021_reson8101_hvf/2008-166/374_2037	281/41	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

6fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

5fm 5ft (531_1)

10.9m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

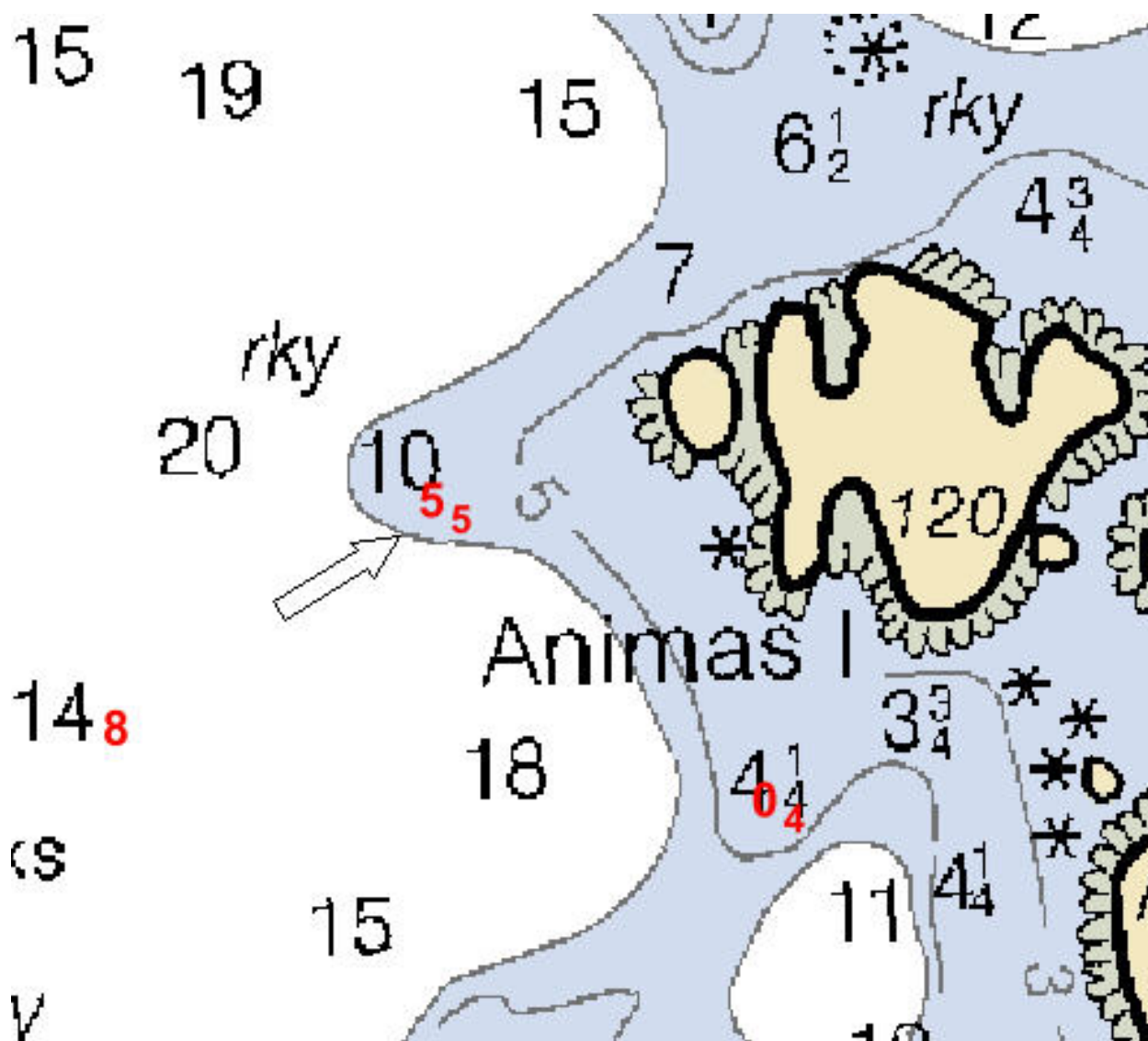


Figure 1.4.1

1.5) Profile/Beam - 336/101 from h11849 / 1021_reson8101_hvf / 2008-166 / 421_2303

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 32' 40.1" N, 133° 27' 08.4" W
Least Depth: 4.18 m (= 13.72 ft = 2.287 fm = 2 fm 1.72 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.377 m ; **TVU (TPEv)** ± 0.159 m
Timestamp: 2008-166.23:04:24.751 (06/14/2008)
Survey Line: h11849 / 1021_reson8101_hvf / 2008-166 / 421_2303
Profile/Beam: 336/101
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/1021_reson8101_hvf/2008-166/421_2303	336/101	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

2 ¼fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

2fm 1ft (531_1)

4.2m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

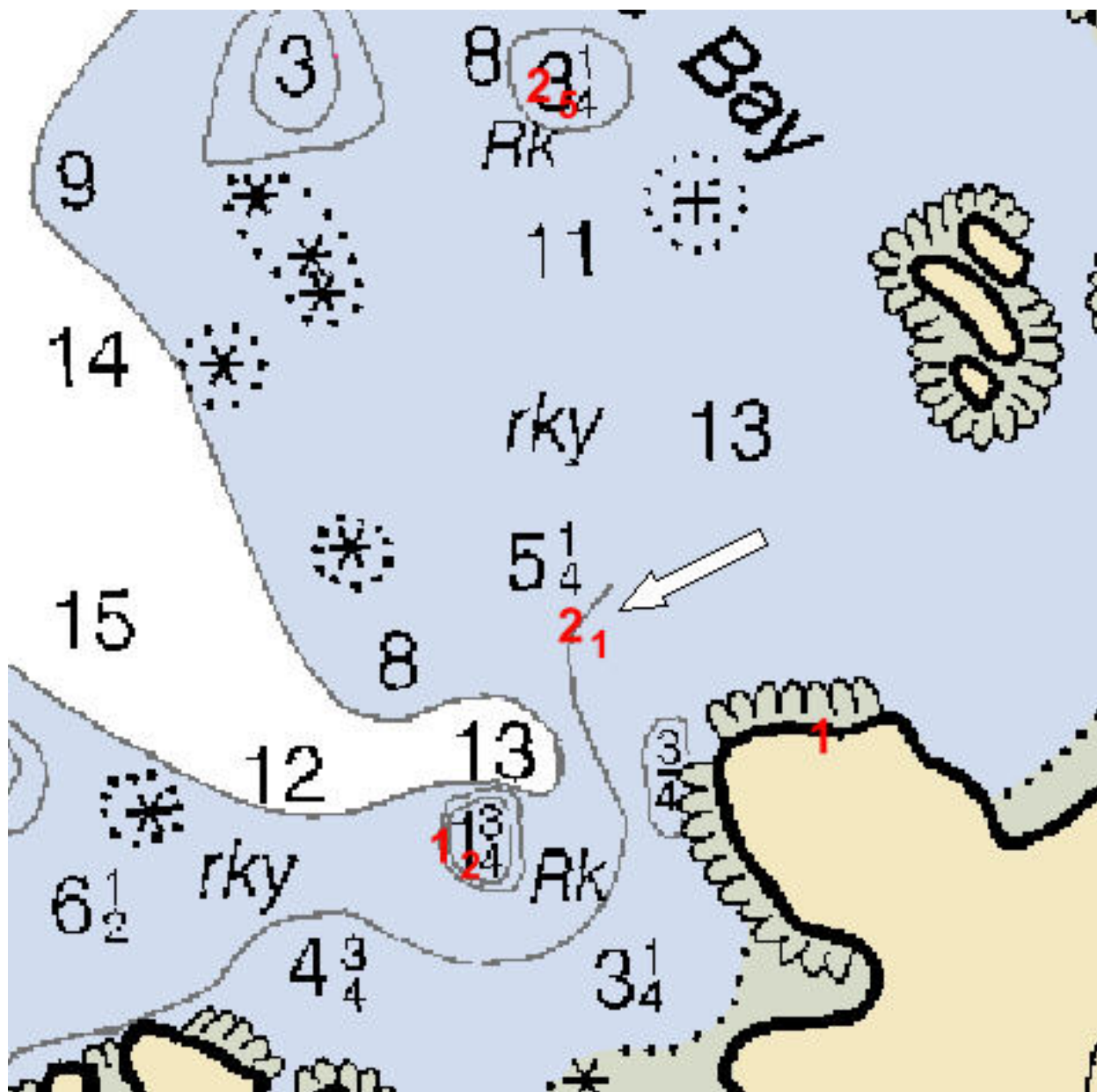


Figure 1.5.1

1.6) Profile/Beam - 2/173 from h11849 / 2801_reson7125_hf_512beams / 2008-164 / 452_2048

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 31' 29.9" N, 133° 29' 12.9" W
Least Depth: 12.50 m (= 41.02 ft = 6.837 fm = 6 fm 5.02 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.968 m ; **TVU (TPEv)** ± 0.293 m
Timestamp: 2008-164.20:48:55.073 (06/12/2008)
Survey Line: h11849 / 2801_reson7125_hf_512beams / 2008-164 / 452_2048
Profile/Beam: 2/173
Charts Affected: 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

This sounding is located on a submerged rocky outcrop on the southern edge of survey H11849. This feature appears to still be rising towards the south since the shoalest depth was found on the extreme edge of the survey. Shoaler soundings likely exist further to the south beyond the limits of sheet H11849.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2801_reson7125_hf_512beams/2008-164/452_2048	2/173	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

6 $\frac{3}{4}$ fm (17406_1, 17400_1, 16016_1, 530_1)

6fm 5ft (531_1)

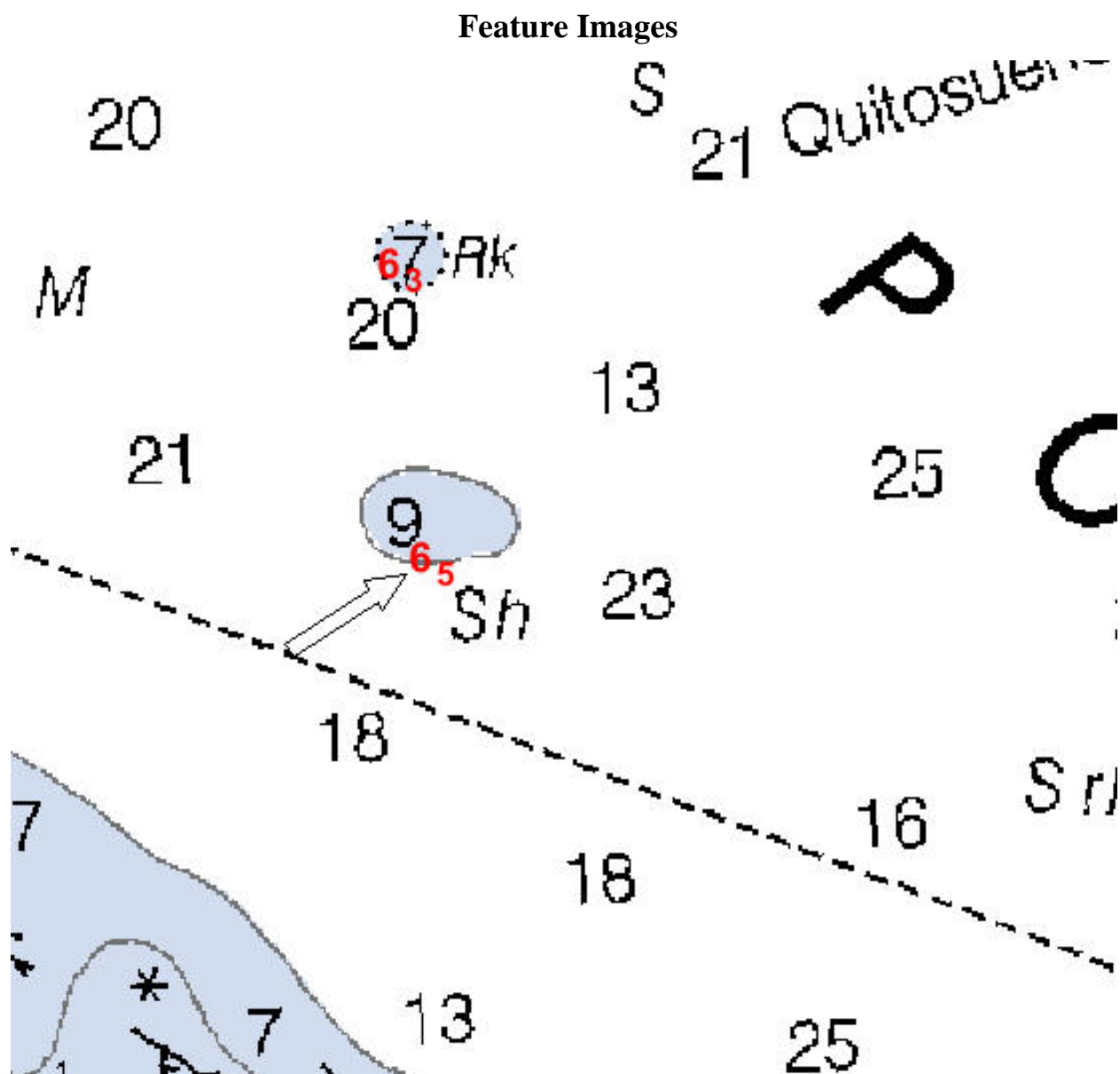
12.5m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080616

SORIND - US, US, survy, H11849

*Figure 1.6.1*

1.7) Profile/Beam - 1892/373 from h11849 / 2801_reson7125_hf_512beams / 2008-164 / 482_2154

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 31' 44.4" N, 133° 28' 08.6" W
Least Depth: 15.27 m (= 50.09 ft = 8.348 fm = 8 fm 2.09 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.973 m ; **TVU (TPEv)** ± 0.283 m
Timestamp: 2008-164.21:58:25.755 (06/12/2008)
Survey Line: h11849 / 2801_reson7125_hf_512beams / 2008-164 / 482_2154
Profile/Beam: 1892/373
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2801_reson7125_hf_512beams/2008-164/482_2154	1892/373	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

8 ¼fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

8fm 2ft (531_1)

15.3m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

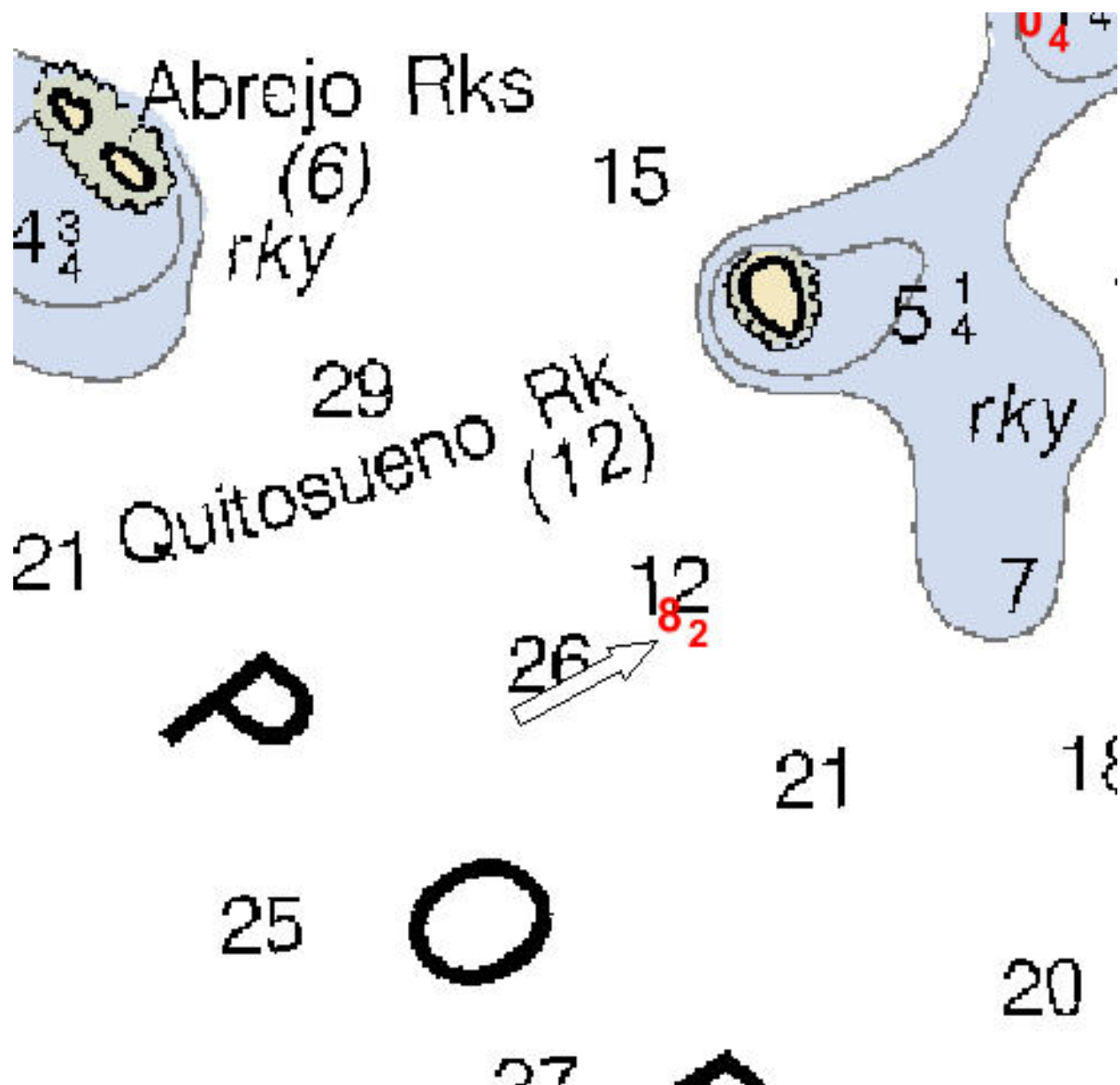


Figure 1.7.1

1.8) Profile/Beam - 514/312 from h11849 / 2801_reson7125_hf_512beams / 2008-164 / 488_2239

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 32' 09.8" N, 133° 28' 26.4" W
Least Depth: 14.69 m (= 48.19 ft = 8.031 fm = 8 fm 0.19 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.966 m ; **TVU (TPEv)** ± 0.304 m
Timestamp: 2008-164.22:41:47.380 (06/12/2008)
Survey Line: h11849 / 2801_reson7125_hf_512beams / 2008-164 / 488_2239
Profile/Beam: 514/312
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2801_reson7125_hf_512beams/2008-164/488_2239	514/312	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

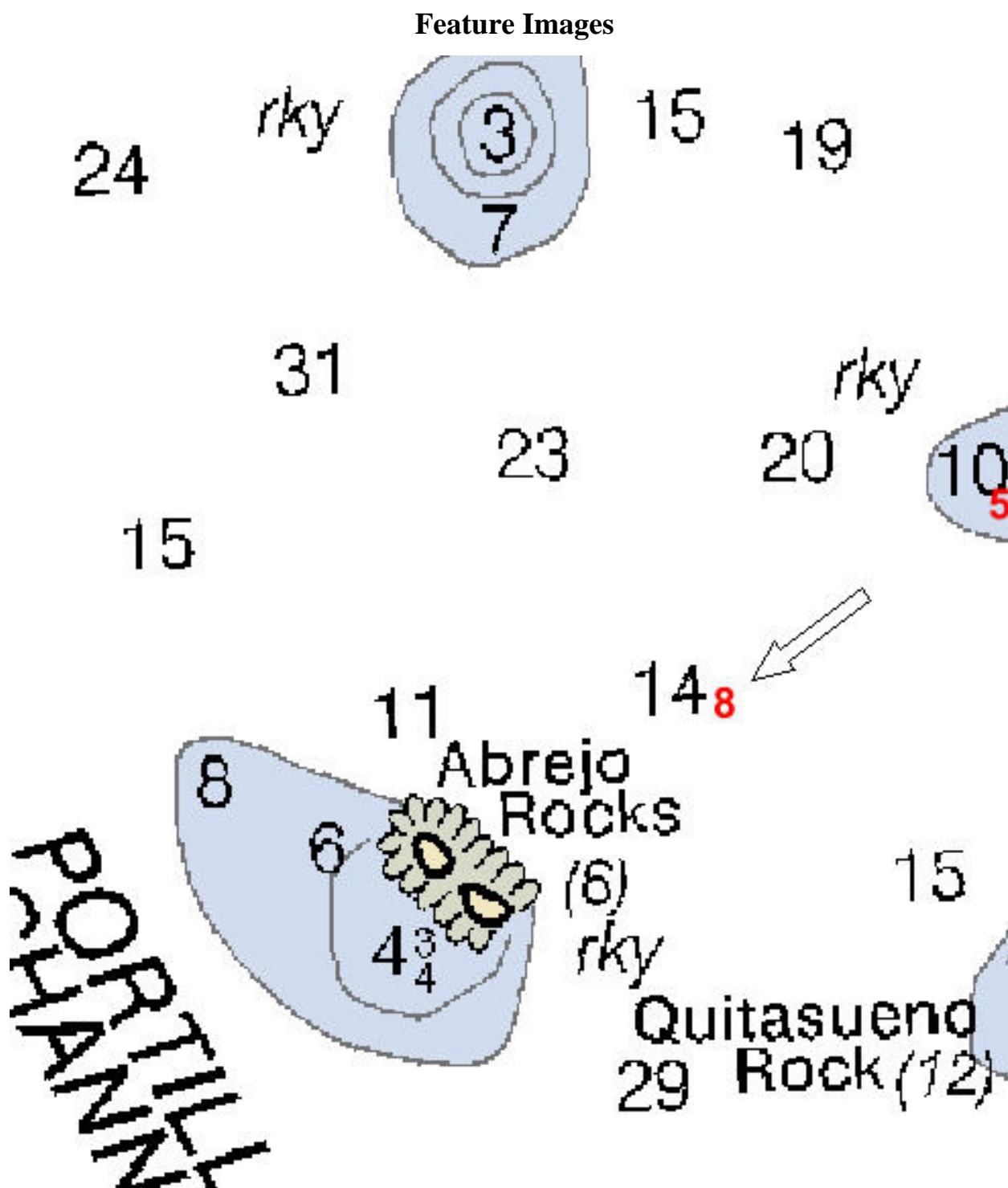
8fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

8fm 0ft (531_1)

14.7m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

*Figure 1.8.1*

1.9) Profile/Beam - 229/161 from h11849 / 2801_reson7125_hf_512beams / 2008-166 / 320_1908

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 33' 56.7" N, 133° 25' 45.5" W
Least Depth: 11.82 m (= 38.77 ft = 6.462 fm = 6 fm 2.77 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.968 m ; **TVU (TPEv)** ± 0.288 m
Timestamp: 2008-166.19:09:46.380 (06/14/2008)
Survey Line: h11849 / 2801_reson7125_hf_512beams / 2008-166 / 320_1908
Profile/Beam: 229/161
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2801_reson7125_hf_512beams/2008-166/320_1908	229/161	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

6 ½fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

6fm 3ft (531_1)

11.8m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

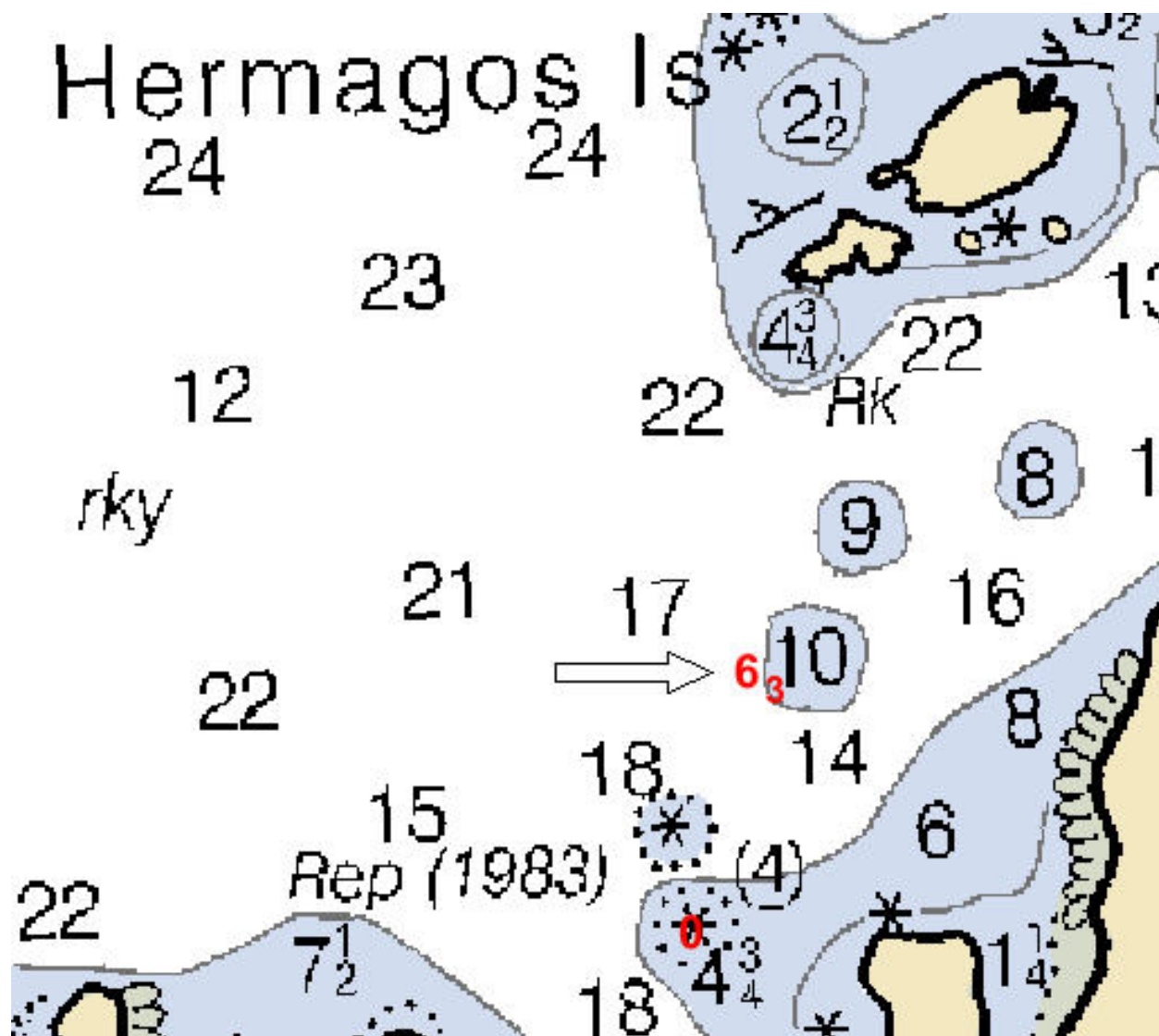


Figure 1.9.1

1.10) Profile/Beam - 133/135 from h11849 / 2801_reson7125_hf_512beams / 2008-166 / 548_0049

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 33' 23.8" N, 133° 27' 47.8" W
Least Depth: 13.00 m (= 42.66 ft = 7.110 fm = 7 fm 0.66 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.971 m ; **TVU (TPEv)** ± 0.280 m
Timestamp: 2008-167.00:49:36.985 (06/15/2008)
Survey Line: h11849 / 2801_reson7125_hf_512beams / 2008-166 / 548_0049
Profile/Beam: 133/135
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2801_reson7125_hf_512beams/2008-166/548_0049	133/135	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

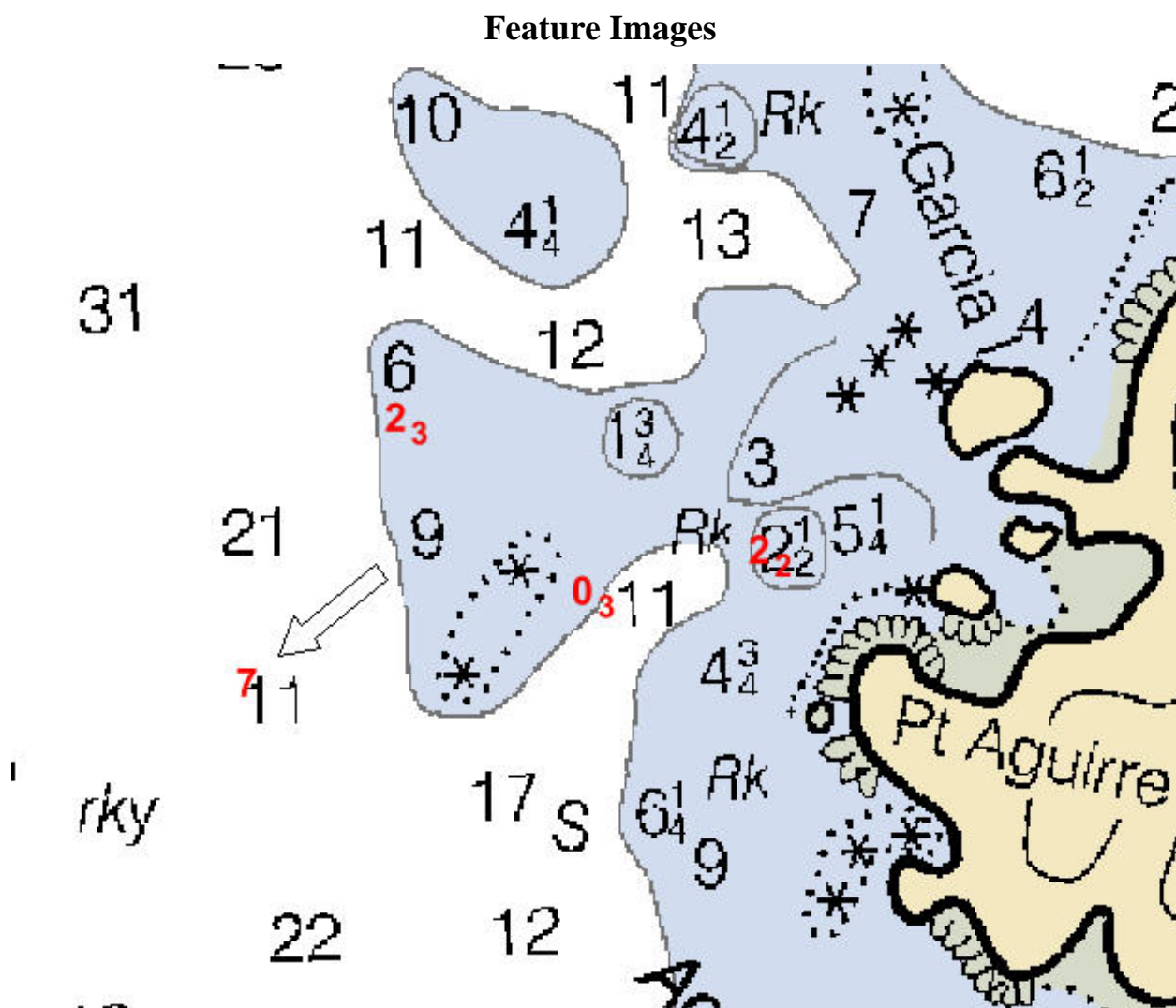
7fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

7fm 0ft (531_1)

13.0m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849



1.11) Profile/Beam - 212/160 from h11849 / 2802_reson7125_hf_512beams / 2008-137 / 236_1725

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 34' 07.3" N, 133° 23' 38.9" W
Least Depth: 15.25 m (= 50.03 ft = 8.339 fm = 8 fm 2.03 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.970 m ; **TVU (TPEv)** ± 0.290 m
Timestamp: 2008-137.17:26:41.354 (05/16/2008)
Survey Line: h11849 / 2802_reson7125_hf_512beams / 2008-137 / 236_1725
Profile/Beam: 212/160
Charts Affected: 17404_1, 17405_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2802_reson7125_hf_512beams/2008-137/236_1725	212/160	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

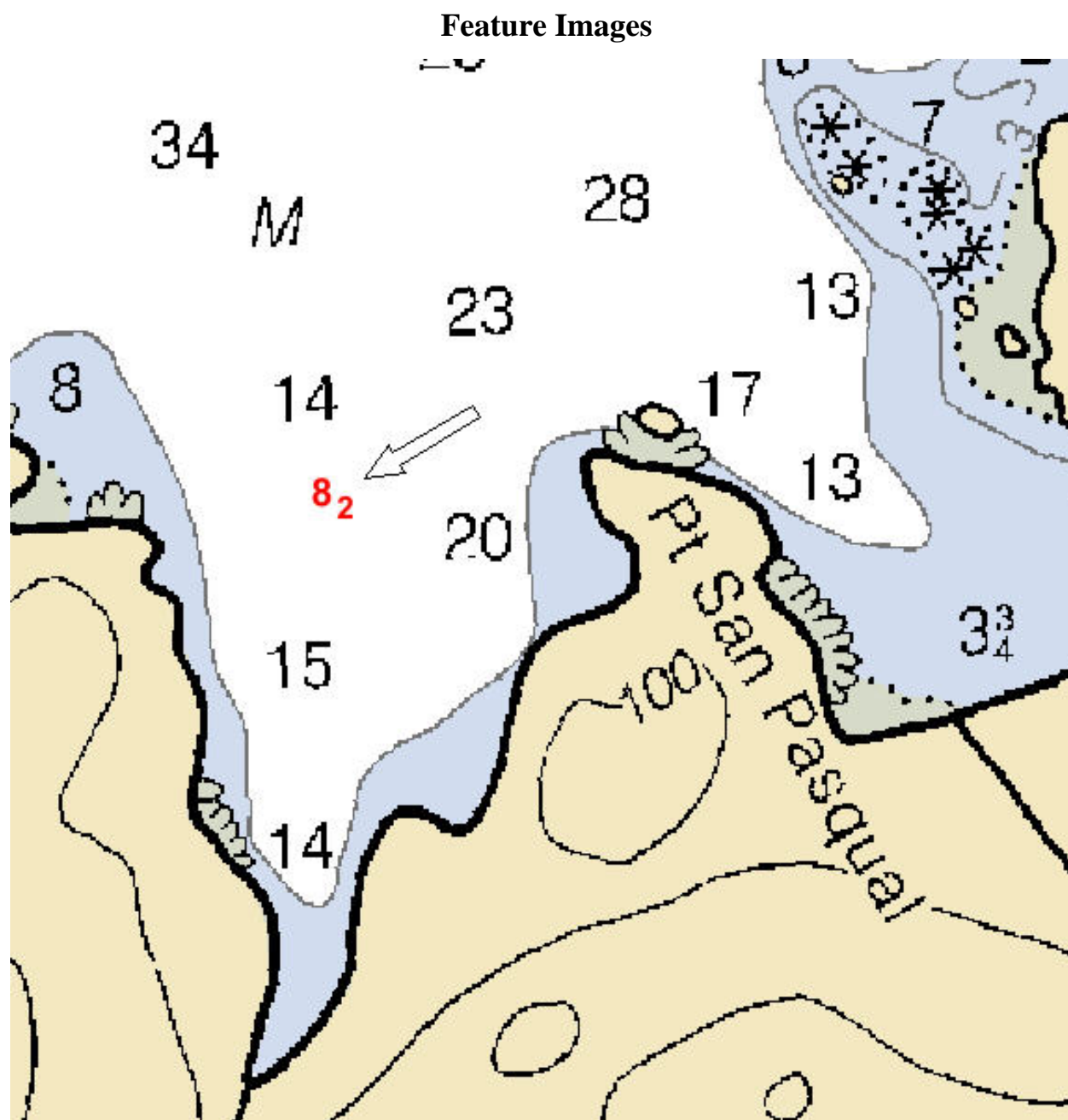
8 ¼fm (17404_1, 17405_1, 17400_1, 16016_1, 530_1)

8fm 2ft (531_1)

15.3m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

*Figure 1.11.1*

1.12) Profile/Beam - 1077/254 from h11849 / 2802_reson7125_lf_256beams / 2008-137 / 340_2110

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 34' 47.3" N, 133° 22' 33.4" W
Least Depth: 11.87 m (= 38.95 ft = 6.491 fm = 6 fm 2.95 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.981 m ; **TVU (TPEv)** ± 0.277 m
Timestamp: 2008-137.21:13:57.500 (05/16/2008)
Survey Line: h11849 / 2802_reson7125_lf_256beams / 2008-137 / 340_2110
Profile/Beam: 1077/254
Charts Affected: 17404_1, 17405_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2802_reson7125_lf_256beams/2008-137/340_2110	1077/254	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

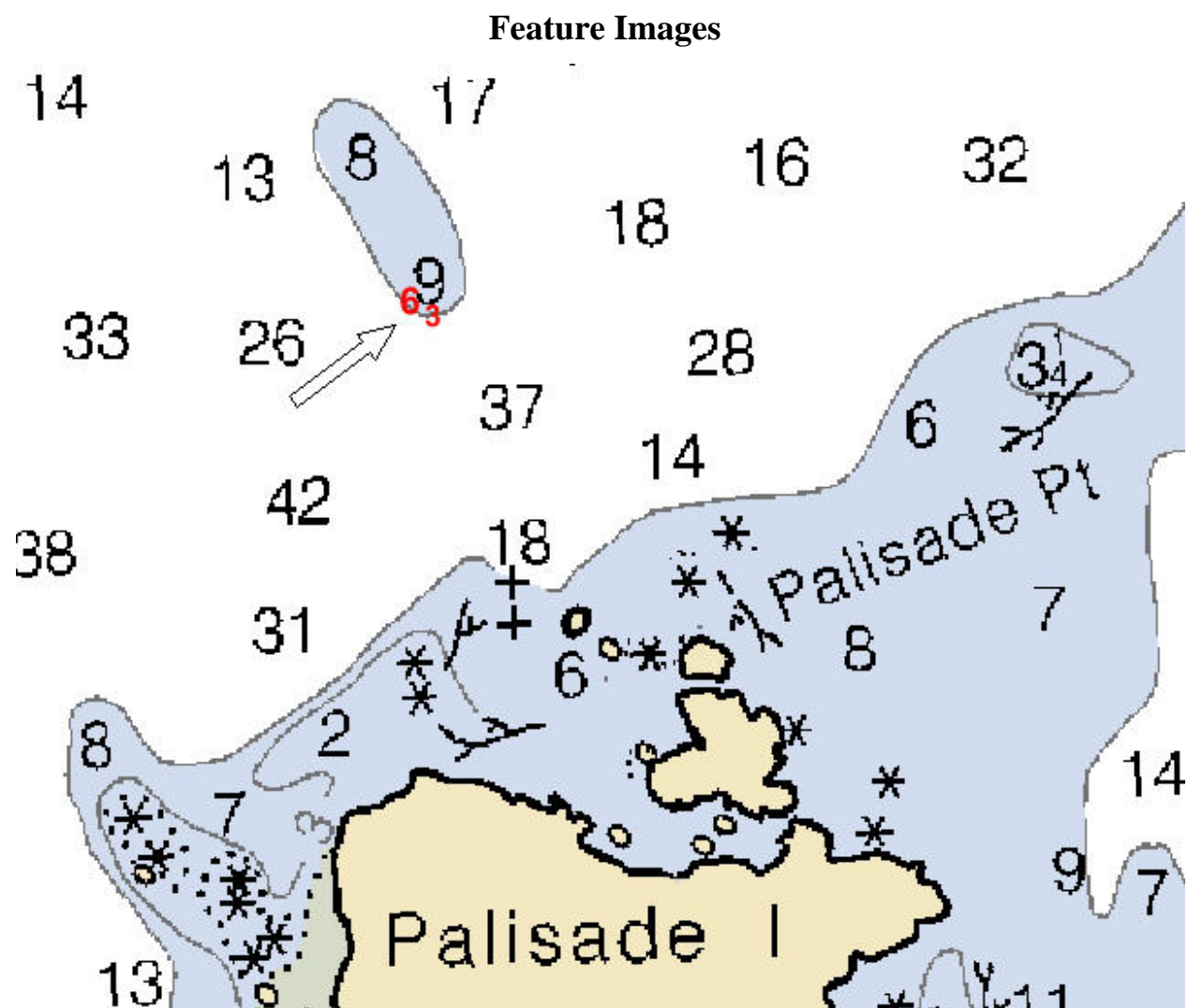
6 ½fm (17404_1, 17405_1, 17400_1, 16016_1, 530_1)

6fm 3ft (531_1)

11.9m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

*Figure 1.12.1*

1.13) Profile/Beam - 943/4 from h11849 / 2802_reson7125_lf_256beams / 2008-164 / 300_1732

DANGER TO NAVIGATION

Survey Summary

Survey Position: 55° 33' 07.1" N, 133° 27' 58.5" W
Least Depth: 19.30 m (= 63.31 ft = 10.551 fm = 10 fm 3.31 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 2.003 m ; **TVU (TPEv)** ± 0.330 m
Timestamp: 2008-164.17:36:16.375 (06/12/2008)
Survey Line: h11849 / 2802_reson7125_lf_256beams / 2008-164 / 300_1732
Profile/Beam: 943/4
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DTON

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11849/2802_reson7125_lf_256beams/2008-164/300_1732	943/4	0.00	000.0	Primary

Hydrographer Recommendations

Chart with bathymetry from the current survey.

Cartographically-Rounded Depth (Affected Charts):

10 ½fm (17404_1, 17406_1, 17400_1, 16016_1, 530_1)

10fm 3ft (531_1)

19.3m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20080616
 SORIND - US, US, survy, H11849

Feature Images

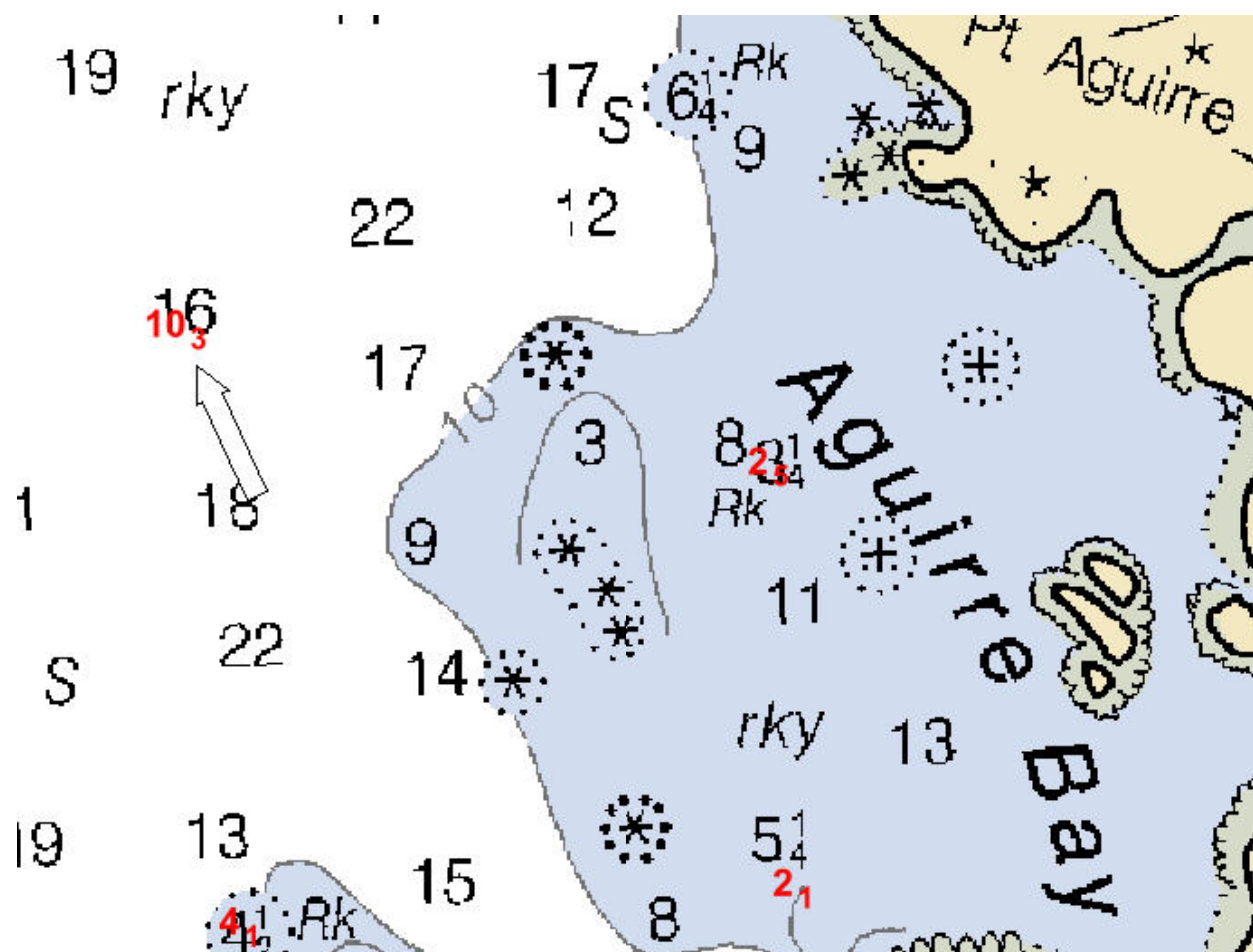


Figure 1.13.1

3 - AWOIS Features

3.1) GP No. - 1 from ChartGPs - Digitized

Primary Feature for AWOIS Item #53653

Search Position: 55° 33' 50.7" N, 133° 25' 52.2" W
Historical Depth: [None]
Search Radius: 100
Search Technique: VS, DI, ES, MB, S2
Technique Notes: [None]

History Notes:

L346/1984--A LARGE ROCK 25-30 FEET ACROSS BARING AT LOW LOW WATER AT ENTRANCE TO GARCIA COVE WAS REPORTED IN SCALED(CHART 17406) POSITION LAT. 55/33/50.69N LONG. 133/25/52.2W (NAD83). ENTERED 4/08 BY JCA.

Survey Summary

Survey Position: 55° 33' 51.1" N, 133° 25' 51.9" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2008-178.14:11:31 (06/26/2008)
GP Dataset: ChartGPs - Digitized
GP No.: 1
Charts Affected: 17404_1, 17406_1, 17400_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

AWOIS 53653, charted rock disproval. The area of the charted rock was covered with 100% SWMB. The seafloor is relatively flat with depths ranging between 30-35 meters.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	1	0.00	000.0	Primary
OPR-O190-RA-08 AWOIS	AWOIS # 53653	12.74	022.7	Secondary (grouped)

Hydrographer Recommendations

Remove rock from the chart. Replace with bathymetry from the current survey.

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: SORDAT - 20080616
SORIND - US, US, survy, H11849

Office Notes

Concur.

Feature Images

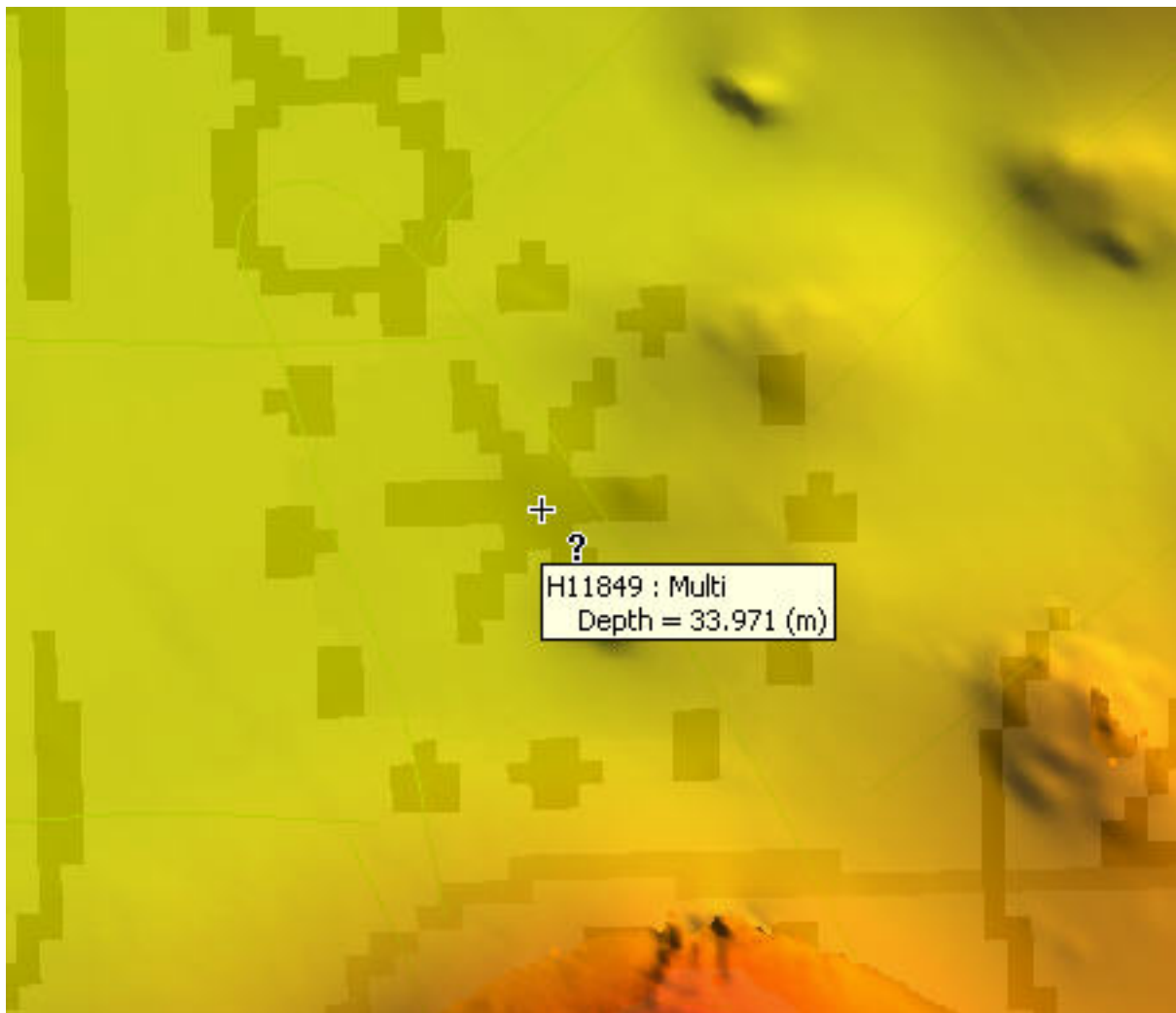


Figure 3.1.1



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 27, 2008

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O190-RA-2008
HYDROGRAPHIC SHEET: H11849

LOCALITY: North San Fernando Island, AK
TIME PERIOD: May 16 - June 16, 2008

TIDE STATION USED: 945-1600 Sitka, AK
Lat. 57° 03.1'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

Preliminary zoning is accepted as the final zoning for project OPR-O190-RA-2008, H11849, during the time period between May 16 and June 16, 2008.

Please use the zoning file "O190RA2008CORP" submitted with the project instructions for West of Prince Wales Island, AK. Zones SA227 & SA228 are the applicable zones for H11849.

Refer to attachments for zoning information.

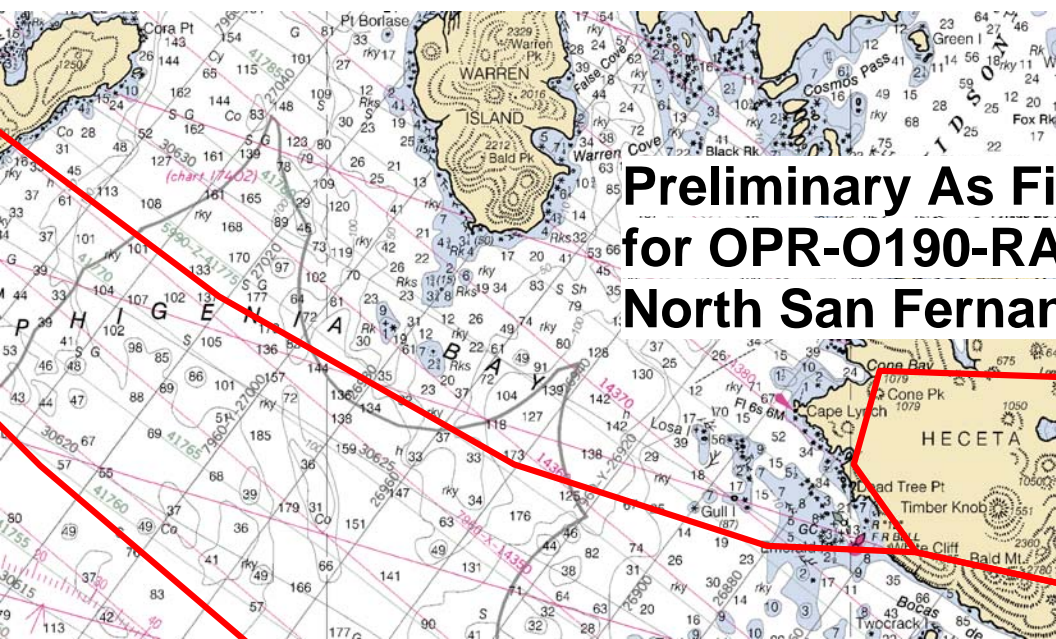
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Peter J. Stone

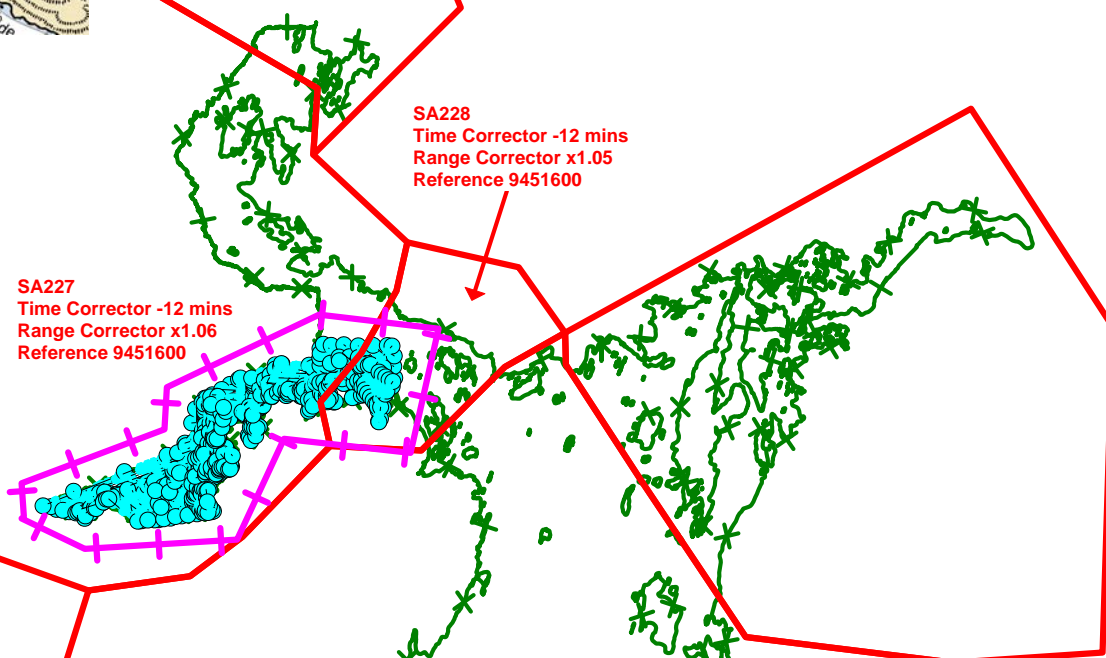
Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/
NOS, email=peter.stone@noaa.gov, c=US
Date: 2008.07.02 07:19:33 -04'00'

CHIEF, PRODUCT AND SERVICES DIVISION





Preliminary As Final Tidal Zoning for OPR-O190-RA-2008, H11849 North San Fernando Island, AK



H11849 HCell Report
Kurt Brown, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11849 used:

Office of Coast Survey HCell Specifications: Draft, Version : 4.0, (date).
HCell Reference Guide: Version 2.0, 22 February, 2010.

1. Compilation Scale

Depths and features for HCell H11849 were compiled to the following raster charts shown in the table, below:

Chart	Scale	Edition	Edition Date	NTM Date
17404	1:40,000	14th	10/01/2008	05/01/2010
17406	1:40,000	7th	02/01/2004	05/01/2010

The following ENC's were also used during compilation:

Chart	Scale
US5AK4CM	1:40,000
US5AK4AM	1:40,000

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built in CARIS BASE Editor from the 4-meter combined surface, H11849_Office_Combined and from the 3-meter lidar surface H11659_3m_FINAL. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below. Soundings from both surveys were included in the H11849_SS layer with can be distinguished by their SORIND.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
-4.7	10	3
10	20	4
20	50	4.5
50	200	5

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

Lidar soundings were also manually selected from the .dgn files for survey H11208.

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 17404	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 H11849_SS.000
0	0	0.000	0.000	0
3	5.4864	5.715	3.125	3
5	9.144	9.3725	5.125	5
10	18.288	18.517	10.125	10
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.

4. Meta Areas

The following Meta object areas are included in HCell H11849:

M_QUAL

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

5. 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 digitized from the Base Surface are included in the HCell. Features to be retained from the chart were bluenoted in the HCell. See the HCell Reference Guide for guidance used in compiling features to the chart scale HCell.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_QUAL	Data quality Meta object
SBDARE	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

7. Spatial Framework

7.1 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.

7.2 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 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.YZ, where X is fathoms, Y is feet, and Z is given as 0. In an ENC viewer, heights (HUNI) display as whole feet.

See the HCell Reference Guide for specific metric to charting units conversion routines and formulas for application of NOAA rounding.

9. Data Processing Notes

With the exception of bluenoting charted features to be retained instead of bringing them in from the ENC, 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

H11849 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

H11849_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H11849_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H11849_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11849_outline.gml	Survey outline
H11849_outline.xsd	Survey outline

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, 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:

Kurt Brown
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206-526-6839
kurt.brown@noaa.gov

APPROVAL SHEET
H11849

Initial Approvals:

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

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

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