

H11901

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-10-12-08

Registry No. H11901

LOCALITY

State Alaska

General Locality Pavlof Island

Sublocality Bluff Point to Arch Point

2008

CHIEF OF PARTY

..... Commander Donald W. Haines, NOAA

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H11901</p>
<p>INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p>	<p>FIELD No: RA-10-12-08</p>
<p>State <u>Alaska</u></p> <hr/> <p>General Locality <u>Pavlof Island</u></p> <hr/> <p>Sub-Locality <u>Bluff Point to Arch Point</u></p> <hr/> <p>Scale <u>1:10,000</u> Date of Survey <u>6/25/2008 - 8/11/2008</u></p> <p>Instructions dated <u>6/4/2008</u> Project No. <u>OPR-P184-RA-08</u></p> <p>Vessel <u>RA3 (1021), RA1 (1101), RA2 (1103), RA4 (2801), RA5 (2802), RA9 (915 Ceeducer)</u></p> <hr/> <p>Chief of party <u>Commander Donald W. Haines, NOAA</u></p> <hr/> <p>Surveyed by <u>RAINIER Personnel</u></p> <hr/> <p>Soundings by <u>Reson SeaBat 8101, Tilted Reson 8125, Knudsen 320M, Reson SeaBat 7125, Ceeducer</u></p> <hr/> <p>SAR by <u>Fernando Ortiz</u> Compilation by <u>Peter Holmberg</u></p> <hr/> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Projection zones #3 & #4</u></p> <hr/> <p><u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were generated during office processing. Page numbering may be interrupted or non sequential.</u></p> <hr/> <hr/> <hr/>	

Descriptive Report to Accompany Hydrographic Survey H11901

Project OPR-P184-RA-08

Pavlof Island, AK

Bluff Point to Arch Point

Scale 1:10,000

June – August, 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-P184-RA-08 dated June 4, 2008 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is Bluff Point to Arch Point in the Pavlof Islands, Alaska. This survey corresponds to sheet “B” in the sheet layout provided with the Letter Instructions. As per verbal agreement with Hydrographic Surveys Division, the survey limits for H11901 were expanded to the East from what was originally assigned. By covering this additional area, *Rainier* was able to junction with the remaining lidar data in the area and "close out" all lidar junctioning requirements in the Pavlof Islands. *Rainier* will continue surveying to the east in 2009, so the extension will junction nicely with next year's field work (figure 1). The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts and reduce the critical survey area backlog. Many charted features in the project area originate from observations made prior to the 1930s. OPR-P184-RA-08 responds to a request from Southwestern Alaska Pilots who have indicated that this area is seeing increase freighter and passenger traffic.

Complete multibeam echosounder (MBES) coverage up to the lidar junction line was achieved in the survey area in waters 8 meters and deeper. Star-pattern vertical beam echosounder (VBES) data were acquired over lidar investigation items. No lidar coverage exists for an area on the north of the sheet in the vicinity of Long John Lagoon; in this area, H11901 hydrography was extended to the NALL. Total mileage acquired by each vessel and system is referenced in Table 1.

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.

Data Acquisition Type	Hull Number with Mileage (nm)					Total
	1101	1103	1021	2801	2802	
MBES (mainscheme)	13.5		120.9	94.1	130.9	359.4
VBES		6.6				6.6
Crosslines			16.9	3.7	1.6	22.2
Bottom Samples						7
Total Number of Items Investigated						21
Total Area Surveyed (sq. nm)						29.6

Table 1: Acquisition statistics for survey H11901

Data acquisition was conducted from June 25 through August 11, 2008 (DNs 177-224).

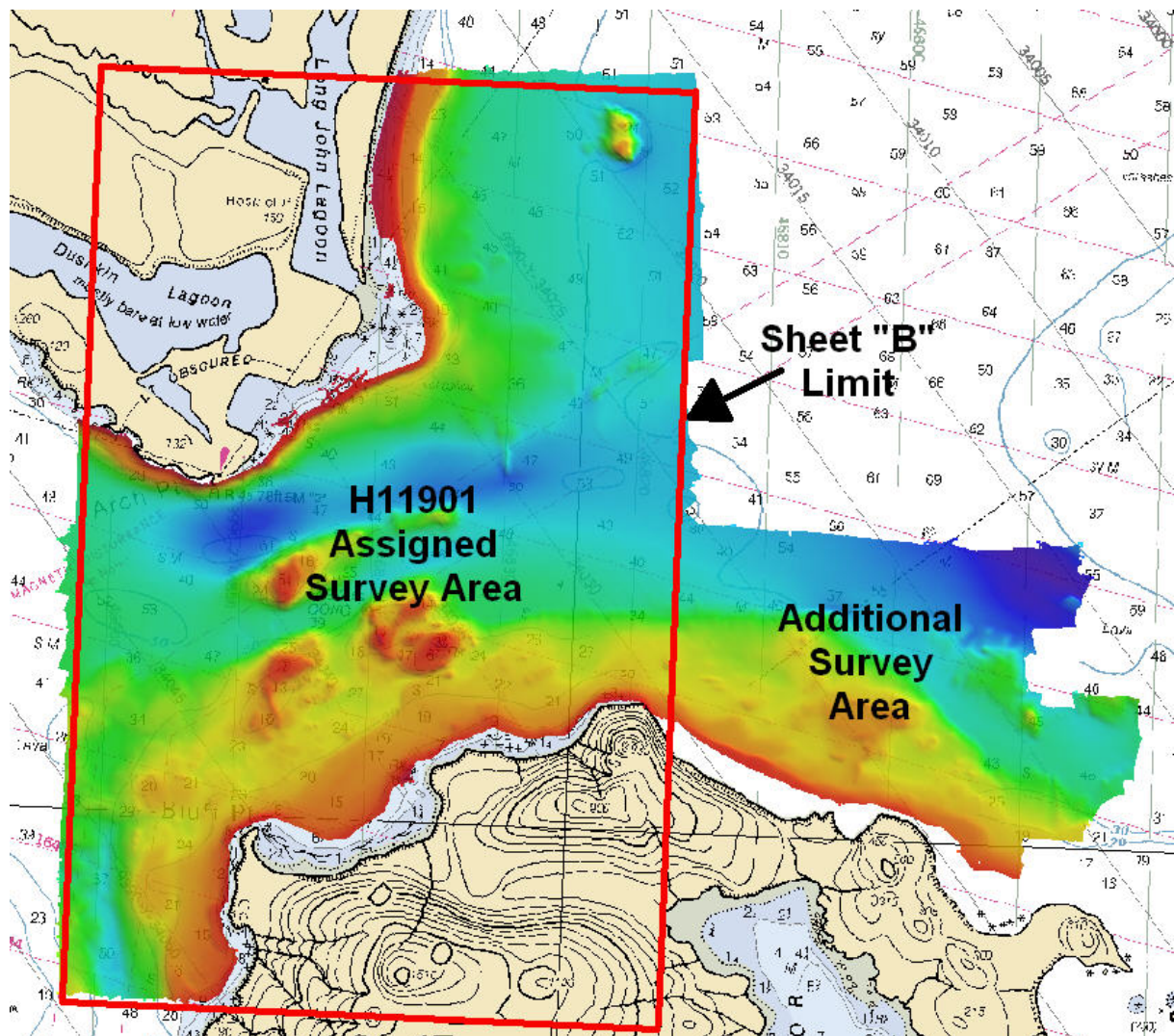


Figure 1: H11901 Survey Limits (Chart 16549).

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-P184-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
1103	RA-2	Vertical Beam Echosounder
1021	RA-3	Multibeam Echosounder
2801	RA-4	Multibeam Echosounder
2802	RA-5	Multibeam Echosounder
916	RA-9	Bottom Samples

Table 2: Data Acquisition Vessels for H11901.

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

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Multi-Beam Echosounder (MBES) crosslines totaled 22.2 nautical miles, comprising 6.1% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode; all areas examined agreed within 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 bathymetric surveys junction with H11901³ (See Figure 1):

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11900	1:10,000	2008	West
H11902	1:10,000	2008	South

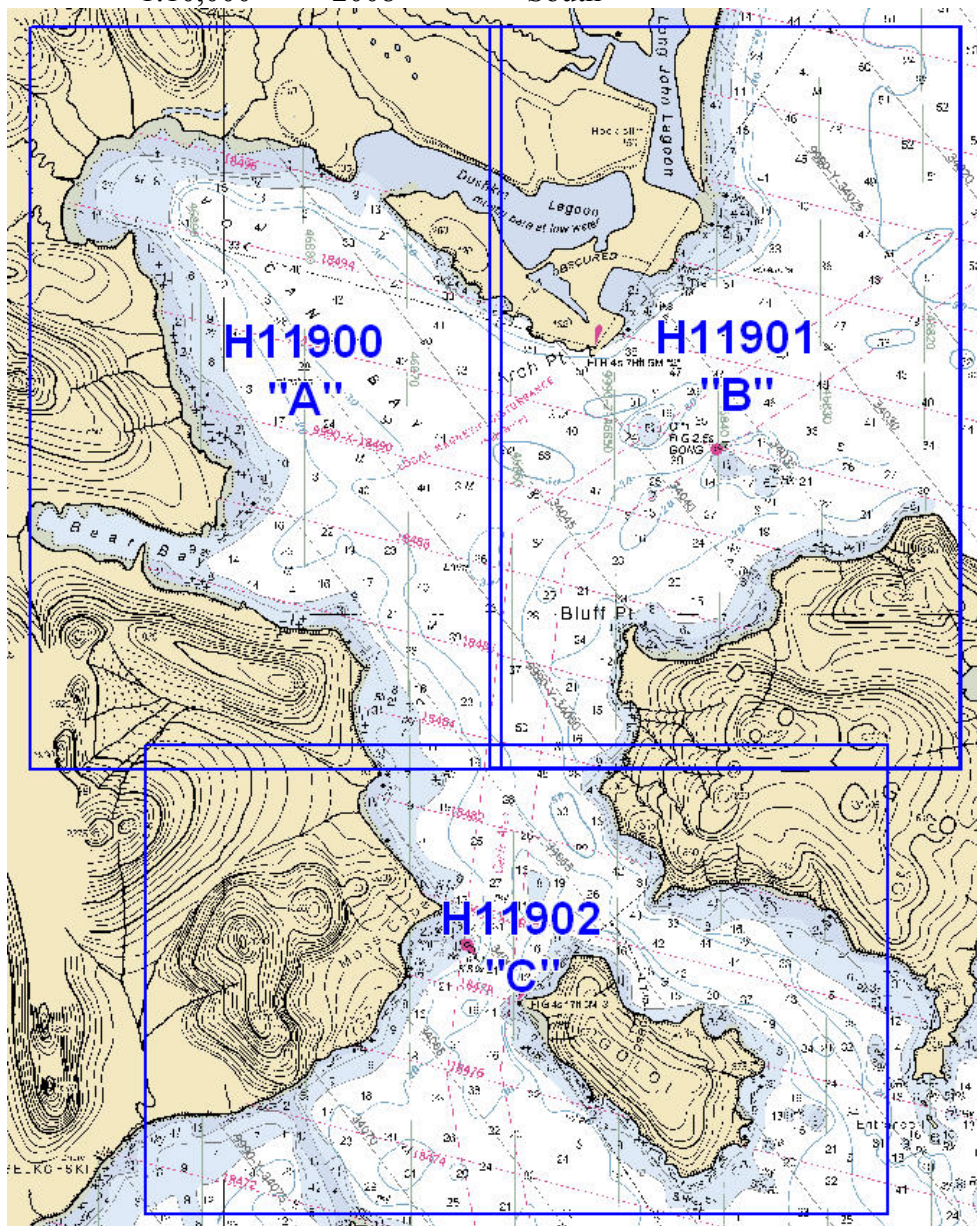


Figure 2: H11901 Contemporary Bathymetry Junction Surveys, chart 16549.

A comparison between H11901 and its two contemporary bathymetric surveys. H11900 and H11902 (figure 2) revealed excellent agreement in all common areas with no significant offsets.⁴ The comparison was made in Caris subset mode; no differences greater than 0.3m were observed.

The following lidar surveys junction with H11901 (See Figure 2):

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11436	1:10,000	2005	Within
H11437	1:10,000	2005	Within

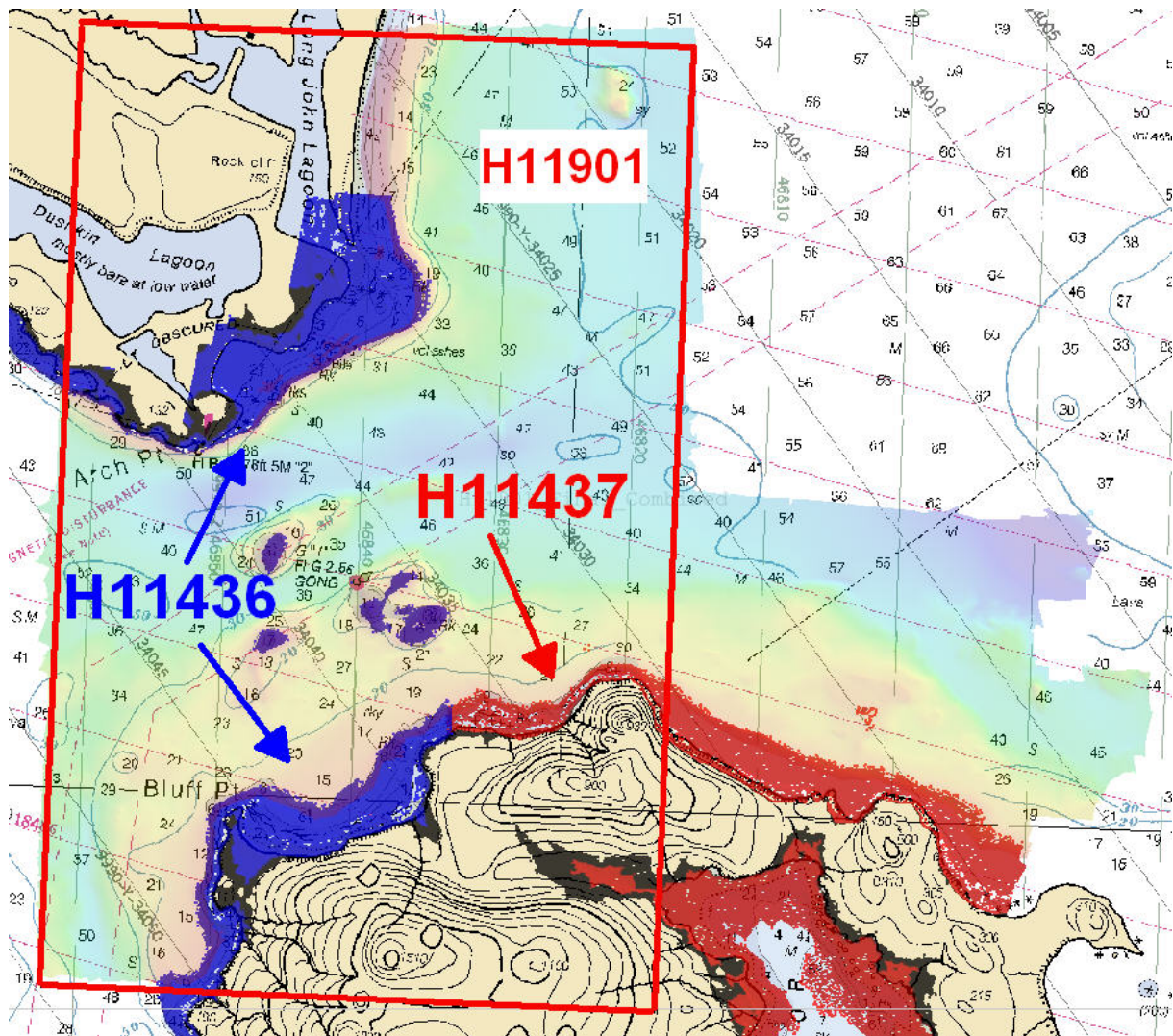


Figure 3: H11901 Lidar Junction Surveys, chart 16549.

The hydrographer compared a final combined BASE surface of H11901 to individual 3-meter BASE surfaces for lidar surveys H11436 and H11437 (figure 3) using CARIS HIPS and SIPS. Much of the common area was on sloping bottom with depths from ten (10) to twenty (20) meters. Depths from H11901 bathymetry were most often found to be shoaler than from either Lidar survey. In most cases the difference was within one (1) meter or less; commonly, the difference was closer to one half (0.5) meter.⁵

Data Quality Factors

Sound Speed Artifacts

Due to fresh water influence, the effects of tidal currents, and other factors, a pronounced demarcation of water masses was sometimes observed in the field. In some areas of H11901 this resulted in less than optimal sound speed correction during post processing and surface creation. A multi-boat, sheet-wide concatenated SVP file was created and correctors applied to the HDCS data using the “Nearest in Distance within 4 hours” method. However, some lines still exhibited the characteristic "smiles" or "frowns" indicative of inaccurate sound speed corrections. Despite the best efforts of the Hydrographer to conduct sufficient sound velocity casts distributed both spatially and temporally, and to correct for sound velocity errors in post processing as stated above, sound velocity errors were still noticeable in some regions. To compensate, the Hydrographer, where possible, rejected soundings obviously in error on the outer beams. In some areas, the resulting surfaces do display some sound speed artifacts, however, the data falls within the specified error budget for the depth ranges where they are found (Figure 4-5).⁶

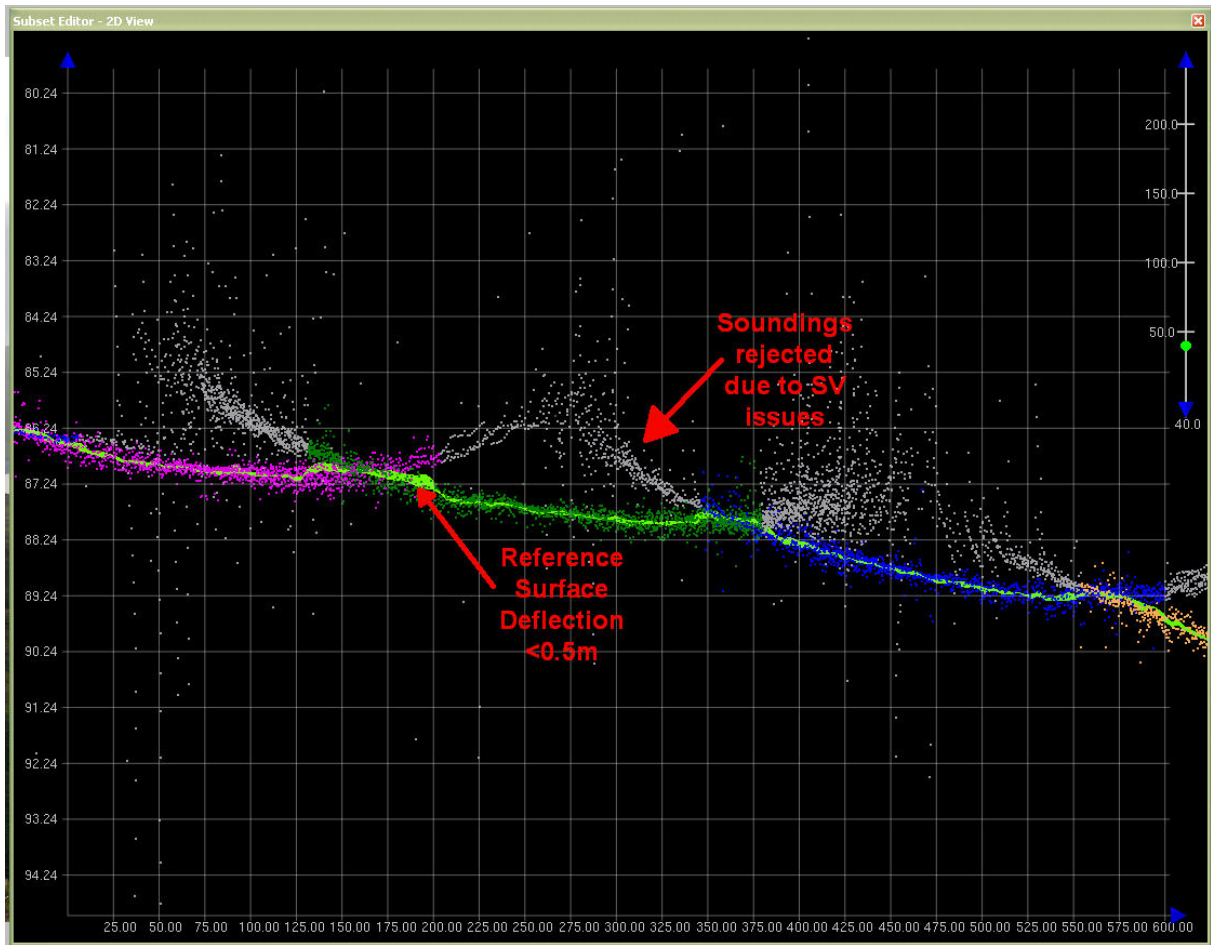


Figure 4: Example of Sound Speed Issue, rejected sounding and surface artifacts.

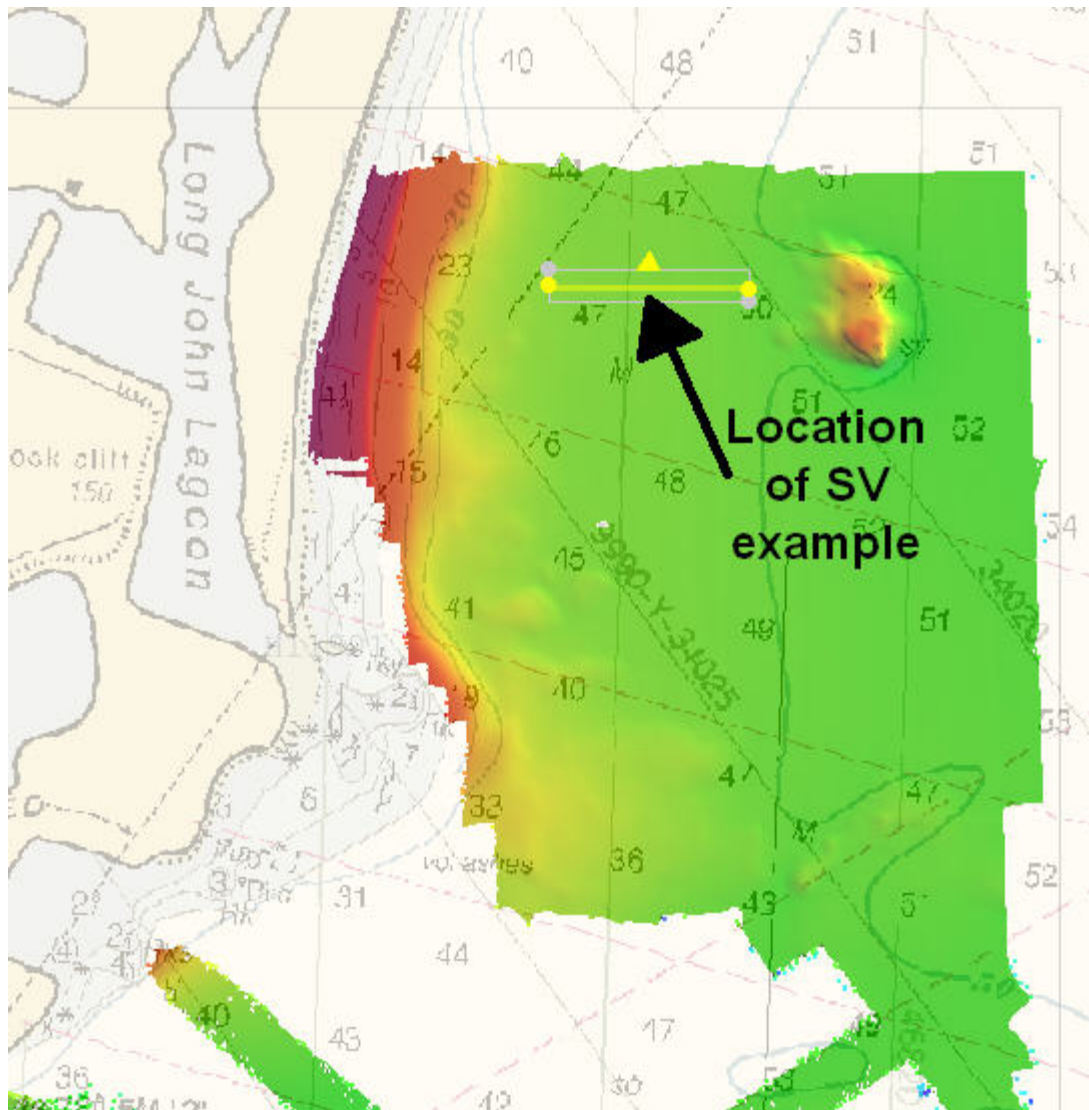


Figure 5: Location of Sound speed Issue (chart 16549).

POS MV Heading Accuracy

During the course of data acquisition, survey personnel on RA-4 and RA-5 noted occasional instances when POS MV heading accuracy decreased from the normal level of $\leq 0.05^\circ$ to a maximum of 0.078° . This phenomenon was seen almost daily, but always self correcting after a period of approximately 15 to 20 minutes. The most likely cause of these incidents was less than optimal satellite geometry and narrower GPS antenna spacing on these two new launches compared with the older boats on *Rainier*.

B3. Data Reduction

Data reduction procedures for survey H11901 conform to those detailed in the *OPR-P184-RA-08 DAPR*. Note that vessel 1021 (RA-3) exhibited intermittent roll bias issues (described in the DAPR). The vessel’s HVF for DN219, was modified to address this issue, then returned to base values on DN220. Also note that on DN191, a replacement IMU was installed on vessel 1021 and new patch test values entered in the HVF.

B4. Data Representation

Many BASE surfaces were used in processing H11901. Final BASE surface resolutions and depth ranges were set in accordance with table 3 below, with field sheets smaller than 25×10^6 nodes. The submission Field Sheet and BASE Surface structure are shown in Figures 6 and 7. (Note: No “H11901_H” was created, and the field sheet limit for H11901_VBES is not shown in figure 7). * For a description of the modifications to the “Deep” configuration of CUBE parameters, refer to the DAPR.

Depth Range (m)	Resolution (m)	CUBE Parameters (Advanced Configuration)
0-21.5	1	Shallow
18.5-52	2	Deep (Modified)*
46-115	4	Deep (Modified)*
103-450	8	Deep (Modified)*

Table 3: Depth ranges, BASE surface resolutions, CUBE Parameters for H11901.

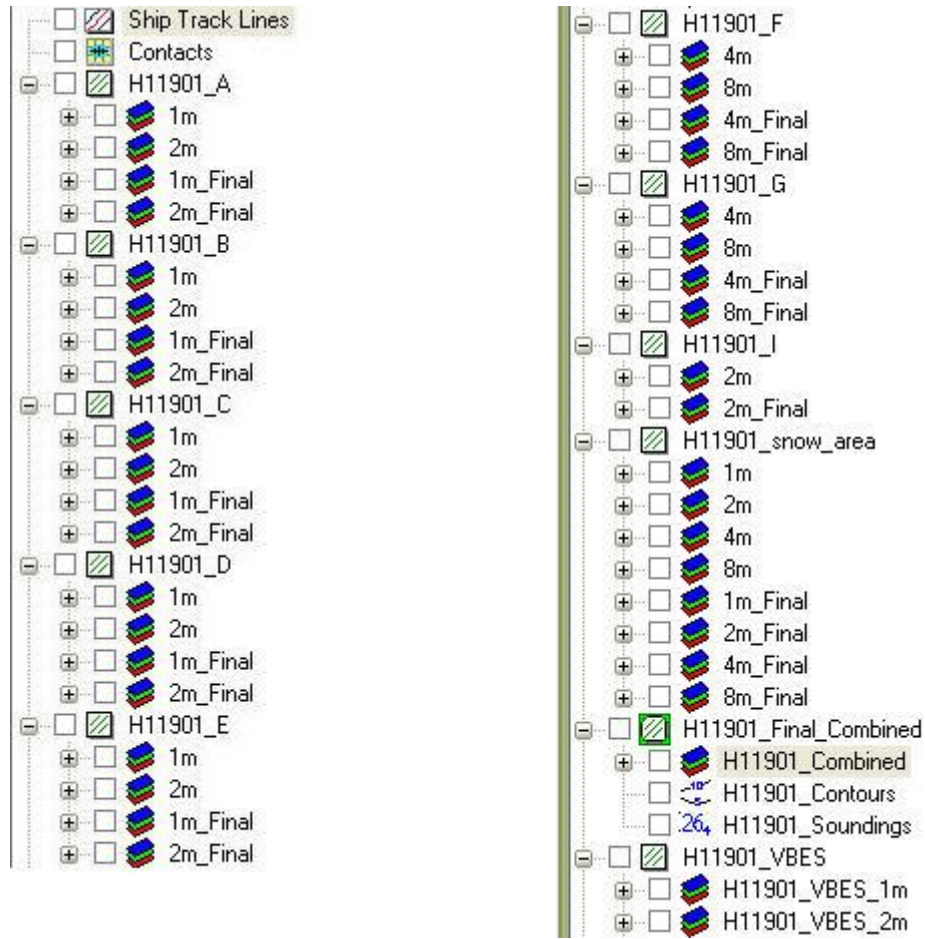


Figure 6: Field sheets and BASE surfaces submitted with H11901.

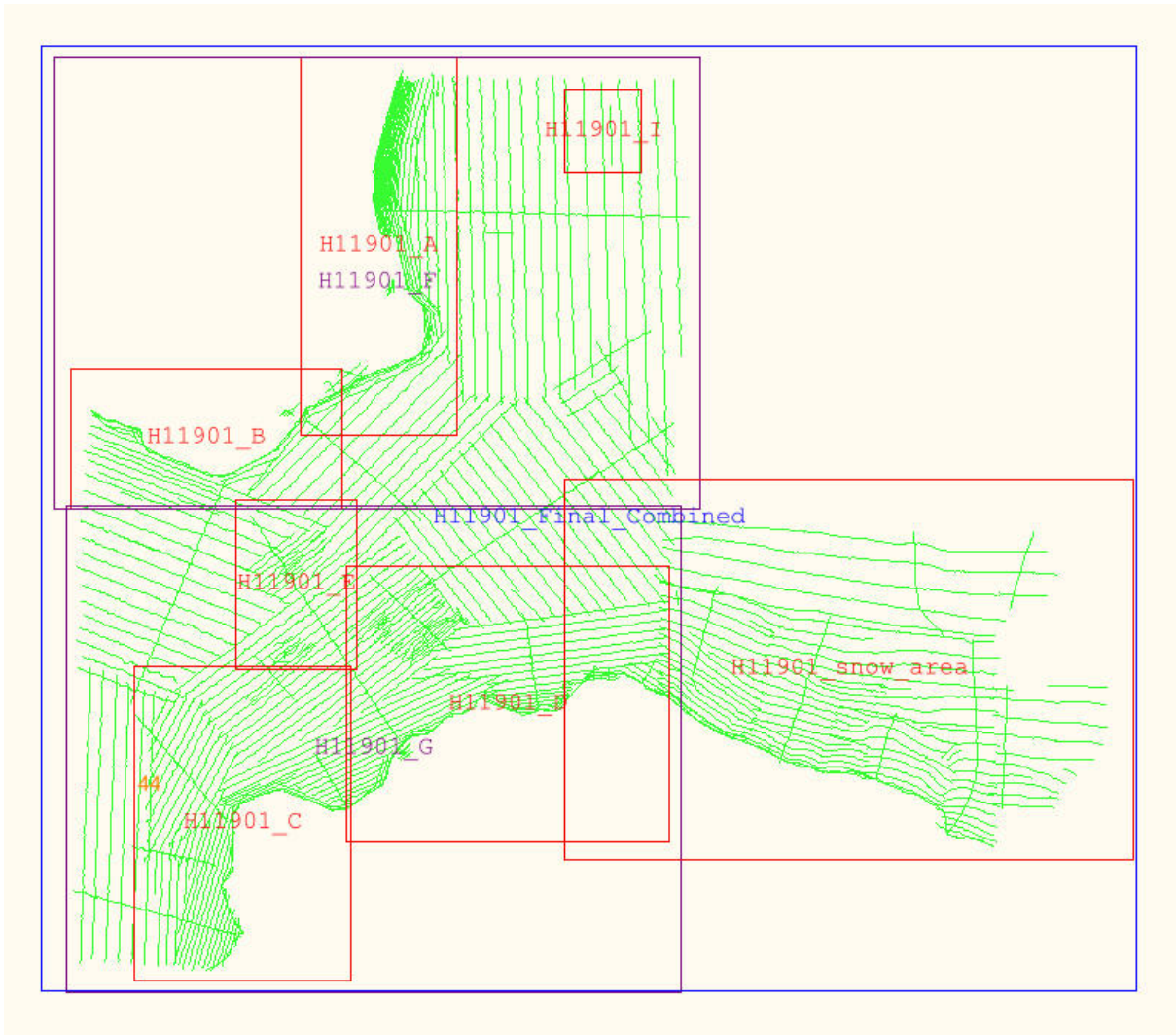


Figure 7: H11901 Field Sheet Layout.

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-P184-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) Zone 4 North. Differential GPS (DGPS) was the sole method of positioning. The differential corrector beacon utilized for this survey is given in Table 4.

Location	Frequency	Operator	Distance	Priority
Cold Bay	289 kHz	USCG	23.5nm	Primary

Table 4: Differential Corrector Sources for H11901.

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 Sand Point, AK (945-9450) served as control for datum determination and as the primary source for water level reducers for survey H11901.

No subordinate water level stations were required.

All data were reduced to MLLW using final approved water levels from station King Cove, AK (945-9881) using the tide file 9459881.tid and final time and height correctors using the zone corrector file P184RA2008CORP.zdf

The request for Final Approved Water Levels for H11901 was submitted to CO-OPS on August 13, 2008 and the Final Tide Note was received on August 20, 2008. This documentation is included in Appendix IV.⁷

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11901 was compared with the following charts:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16549	1:80,000	15 th Ed, July 2003	11/11/2008
16540	1:300,000	12 th Ed; Jan 2005	09/23/2008

Table 5: Charts compared with H11901

The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area, with the following exceptions:

Chart 16549:

A 15 fathom sounding was acquired in a shoal area approximately 250 meters south of a charted 24 fathom depth at the northeast corner of the survey (Figure 8). Surrounded by 50 fathom depths, this shoal area is not very well represented as currently charted.⁸

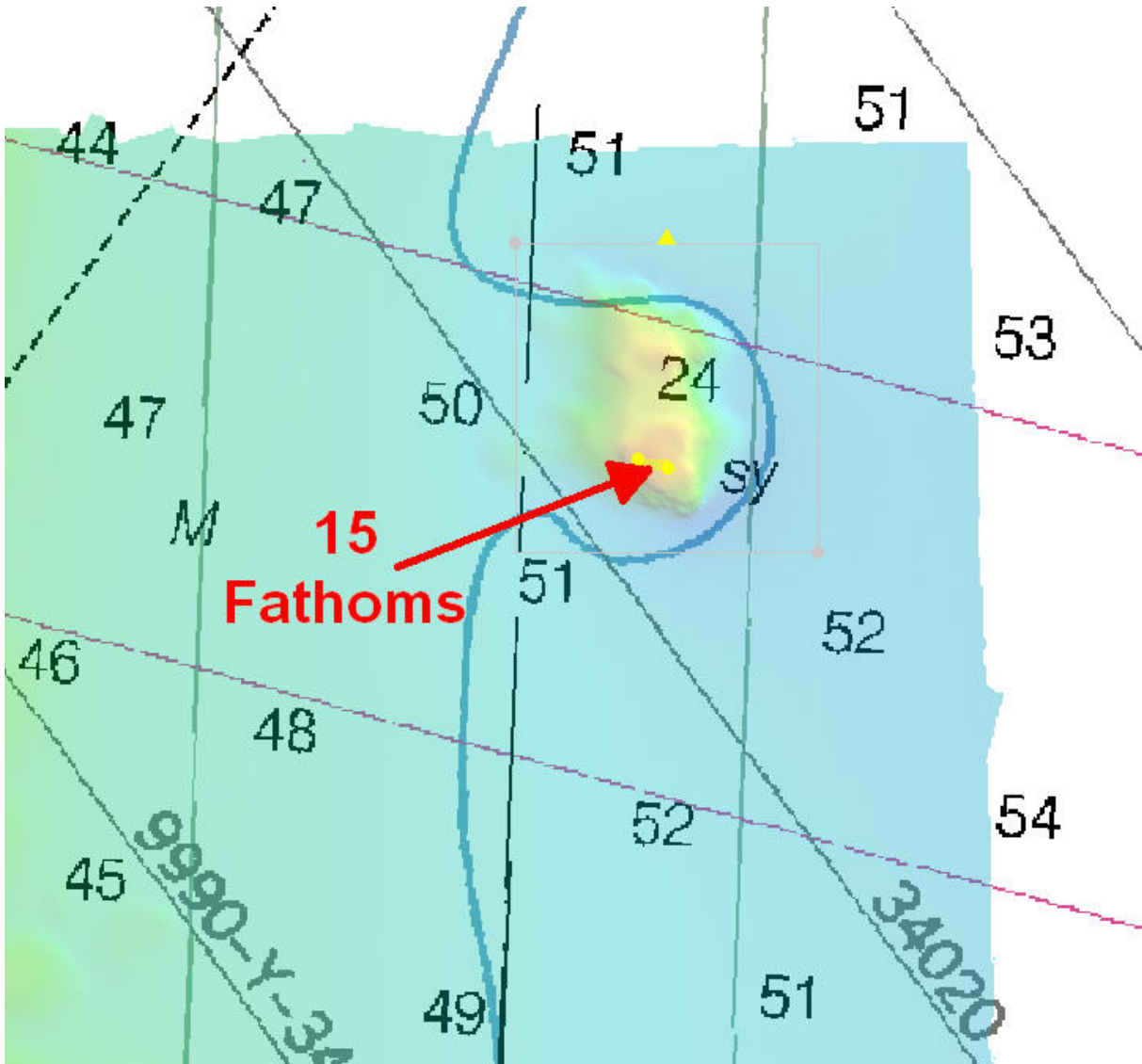


Figure 8: 15 fathom sounding near charted 24 fathom depth (chart 16549).

A 28.5 fathom sounding was acquired approximately 160 meters northwest of a charted 45 fathom depth near the eastern extent of the expanded survey area for H11901.⁹ Depths are sparse in this area of chart 16549(Figure 9).¹⁰

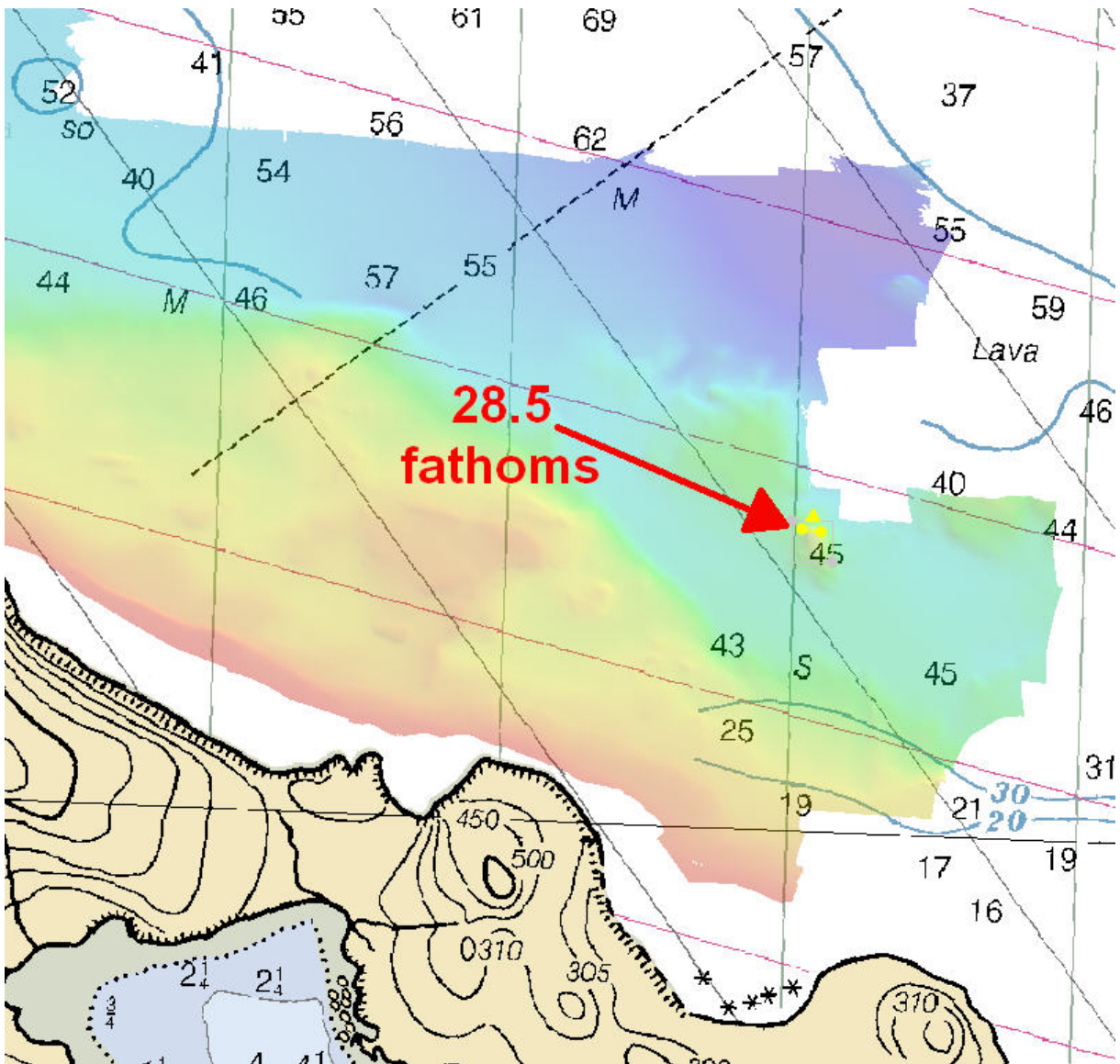


Figure 9: 28.5 fathom sounding (chart 16549).

Complete multibeam coverage was achieved over the charted $1\frac{3}{4}$ fathom depth approximately 300 meters southeast of the G "1" buoy; the least depth detected was 3.3 fathoms (figure 11).¹²

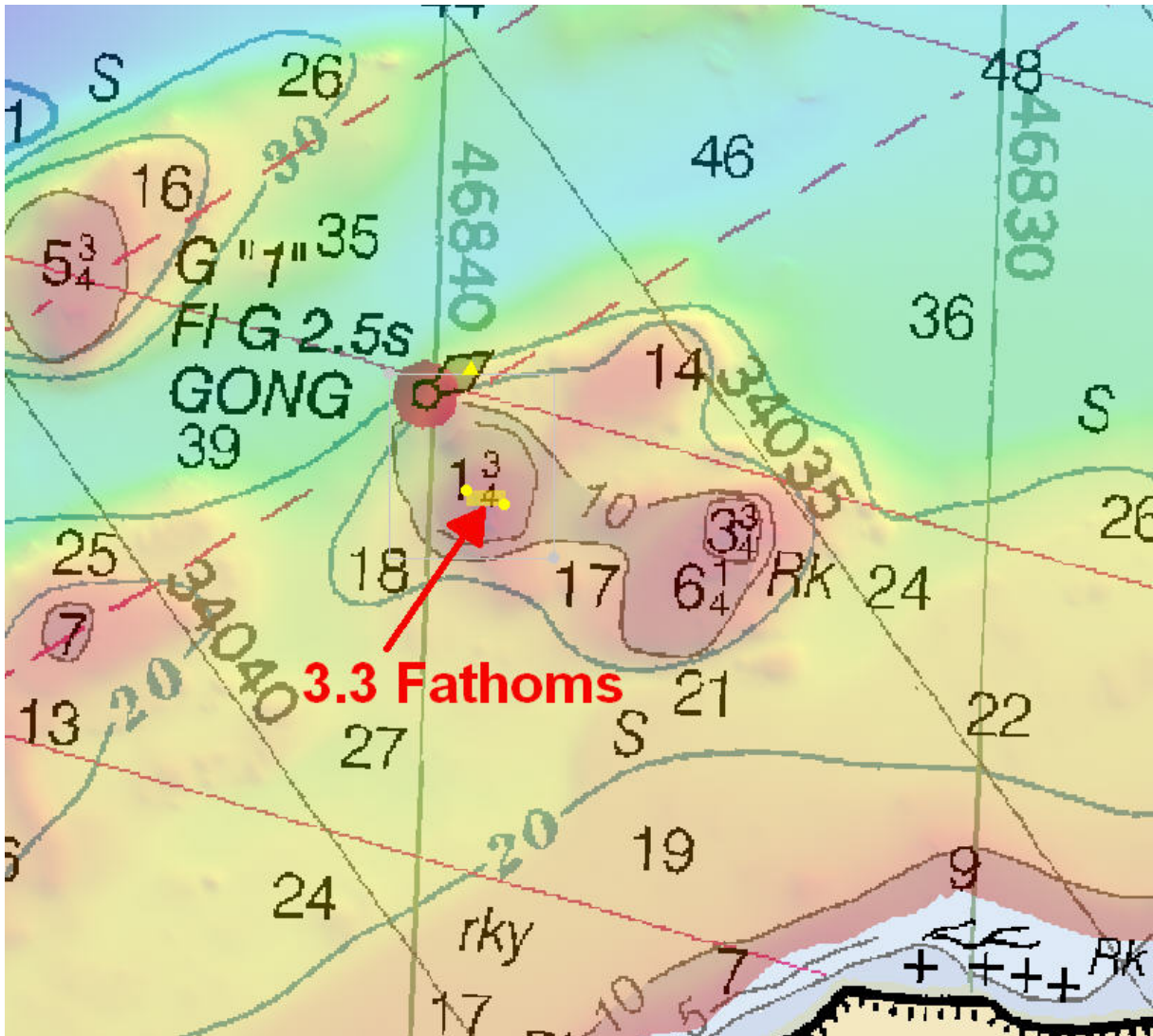


Figure 11: 3.3 Fathom least depth over charted $1\frac{3}{4}$ fathom depth (chart 16549).

Compared with chart 16549, H11901 survey data revealed a general deepening trend in the area east southeast of Arch Point (figure 12). The Hydrographer recommends charting as per digital data.¹³

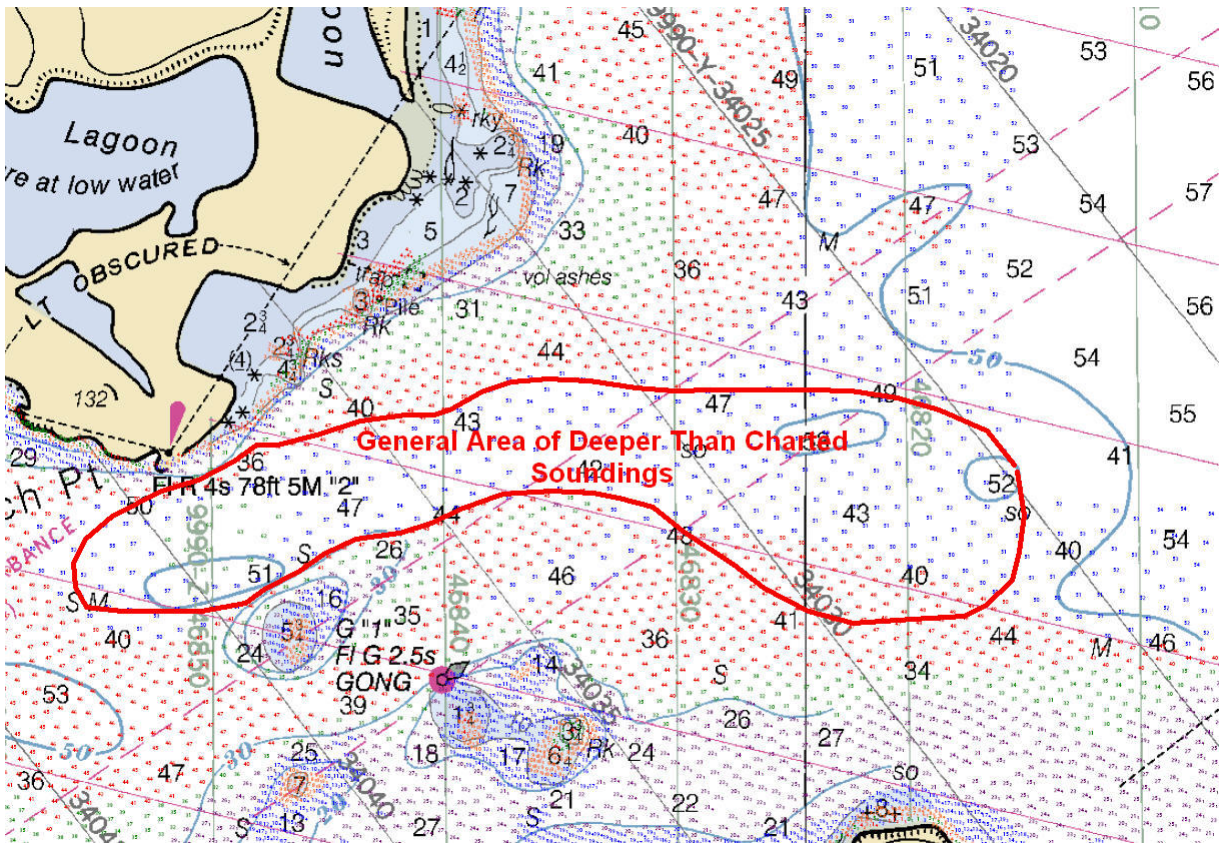


Figure 12: General area of deeper than charted (chart 16549).

Complete multibeam coverage was achieved over a pair of charted dangerous underwater rocks off a northern point of Dolgoi Island; no evidence of either rock was found (figure 13).¹⁴

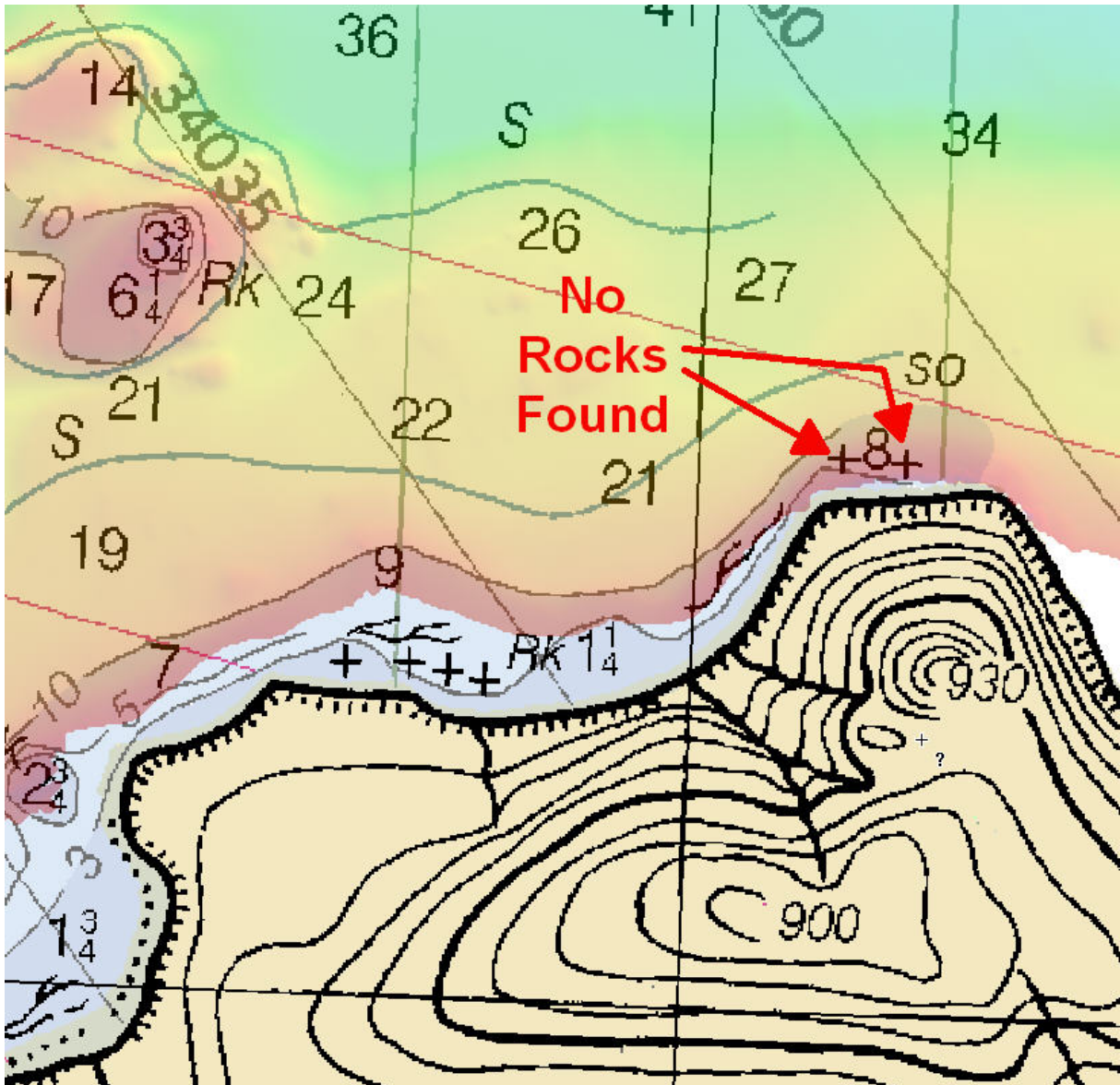


Figure 13: No evidence of charted dangerous underwater rocks (chart 16549).

During investigation of AWOIS item 53691, a Maritime Boundary Claim that identified "...a charted islet in the vicinity of Long John Lagoon," no such islet was found (figure 14). The charted (16549) feature in question is depicted with a solid line, indicative of dry land although it is shaded as an area that covers and uncovers. A small reef-like feature inshore of the charted "islet" was located; for more information refer to the survey feature report in Appendix II and AWOIS item 53691.¹⁵

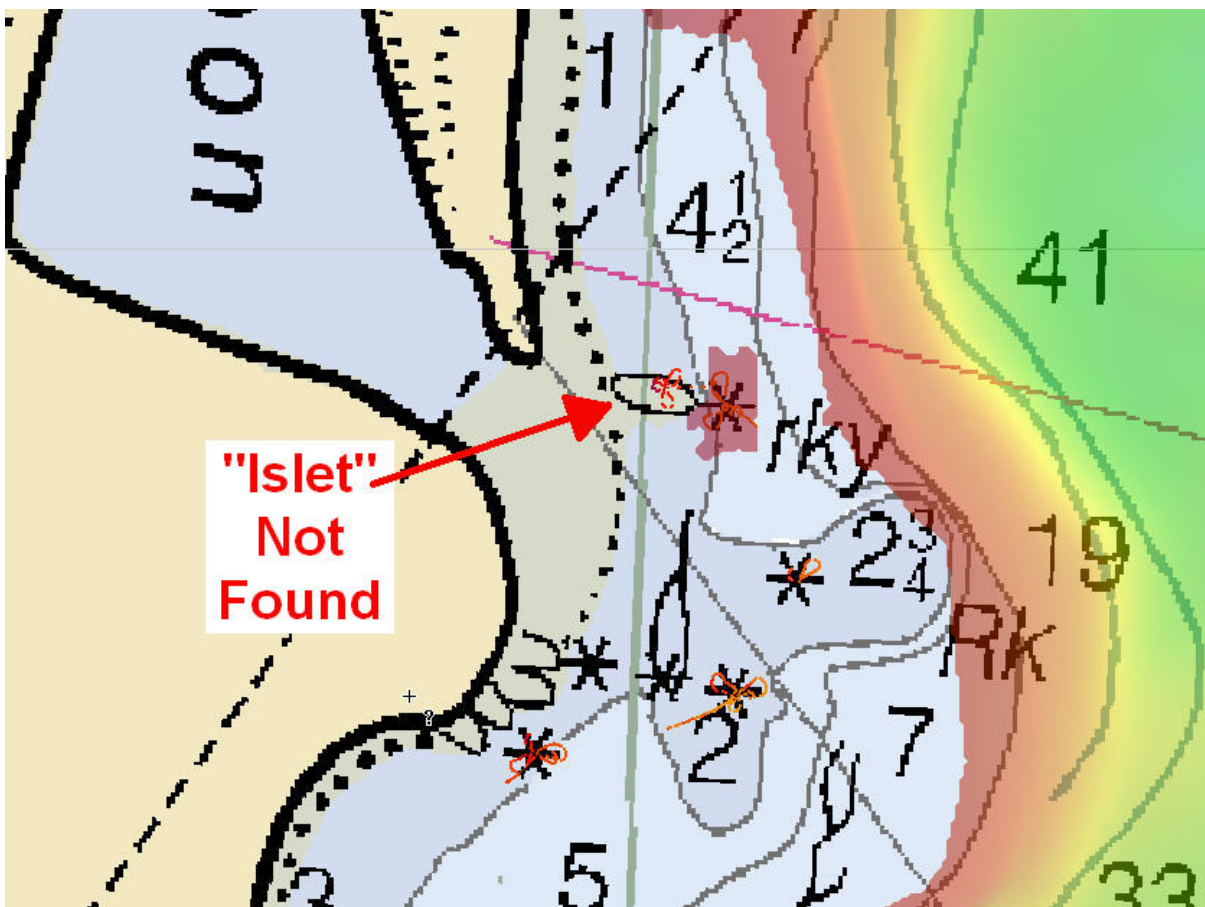


Figure 14: Charted (16549) Islet Not Found.

A charted (16549) three (3) fathom rock (figure 15) between Arch Pt and Long John Lagoon was found to actually be a shoal area; no rock was detected (figure 16). The hydrographer recommends deleting “Rk” from the chart where it relates to this shoal.¹⁶

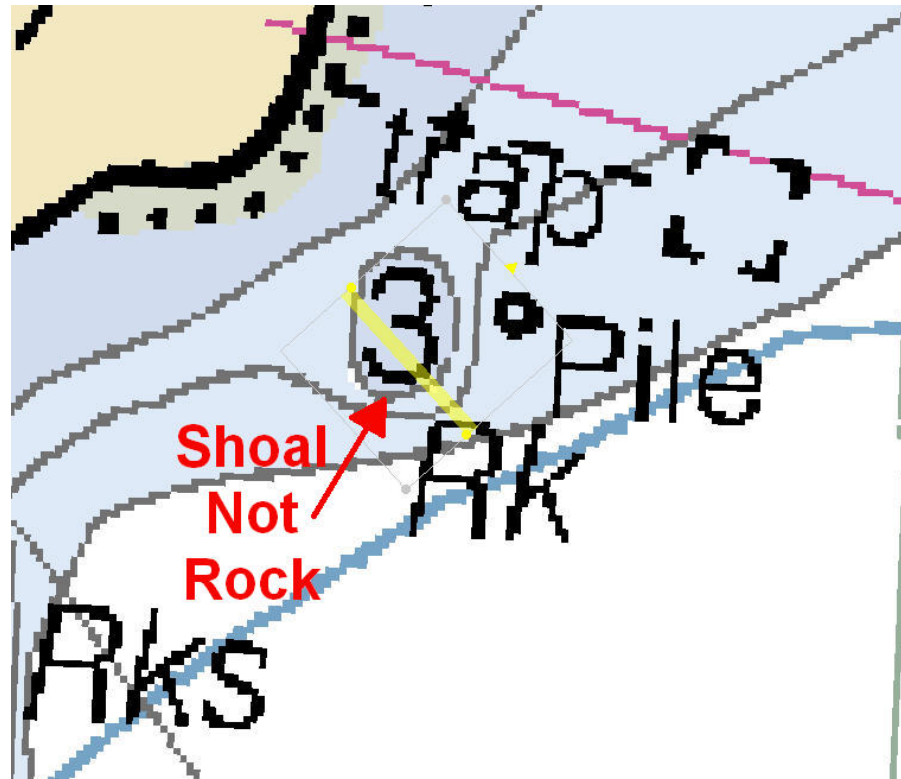


Figure 15: Shoal area, No “Rk” detected.

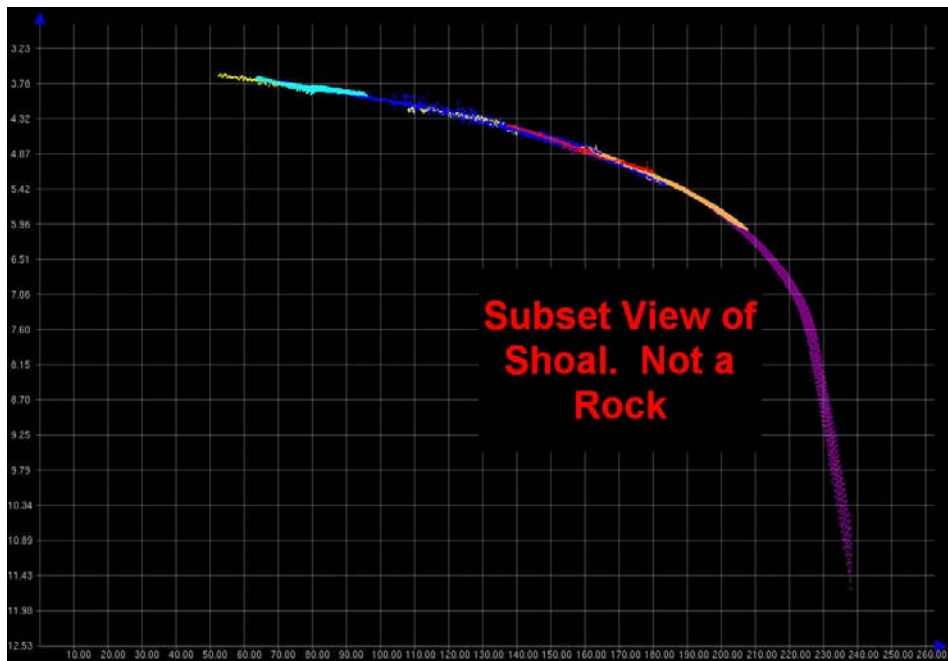


Figure 16: Subset view of Shoal; no Rock Detected.

At Arch Point, H11901 survey data appears to overlap the charted (16549) land area (figure 17). This is most likely due to the over-hanging nature of the geography (figure 18) at that place, and possibly due to less than completely accurate shoreline representation.¹⁷

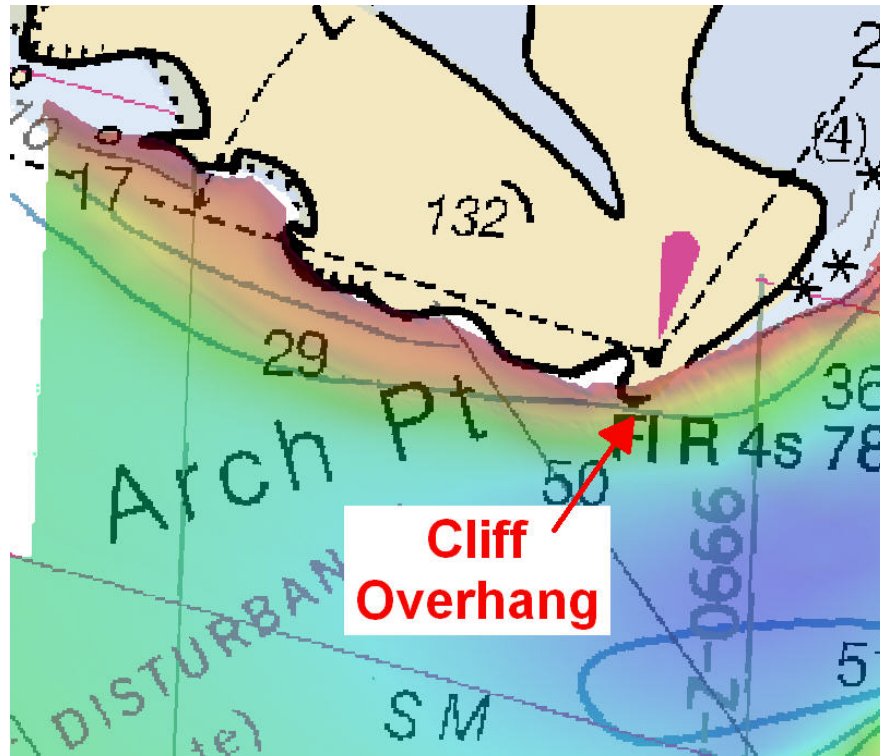


Figure 17: Apparent Overlapping Bathymetry.



Figure 18: Overhanging Cliff Geography.

A charted (16549) pile near shore between Arch Point and Long John Lagoon was not detected (figure 19). According to the composite source .hob file, the charted pile has a source date of 2003, however, a second, uncharted pile feature is present in the same layer with a source date of 1940. It may be that both comp source features represent the same pile, but for cartographic reasons, the pile was moved from its 1940 position, further offshore to where it is currently charted. The hydrographer recommends deleting the pile as charted, however because no data were acquired over the pile's 1940 location, no recommendation for recharting is included.¹⁸

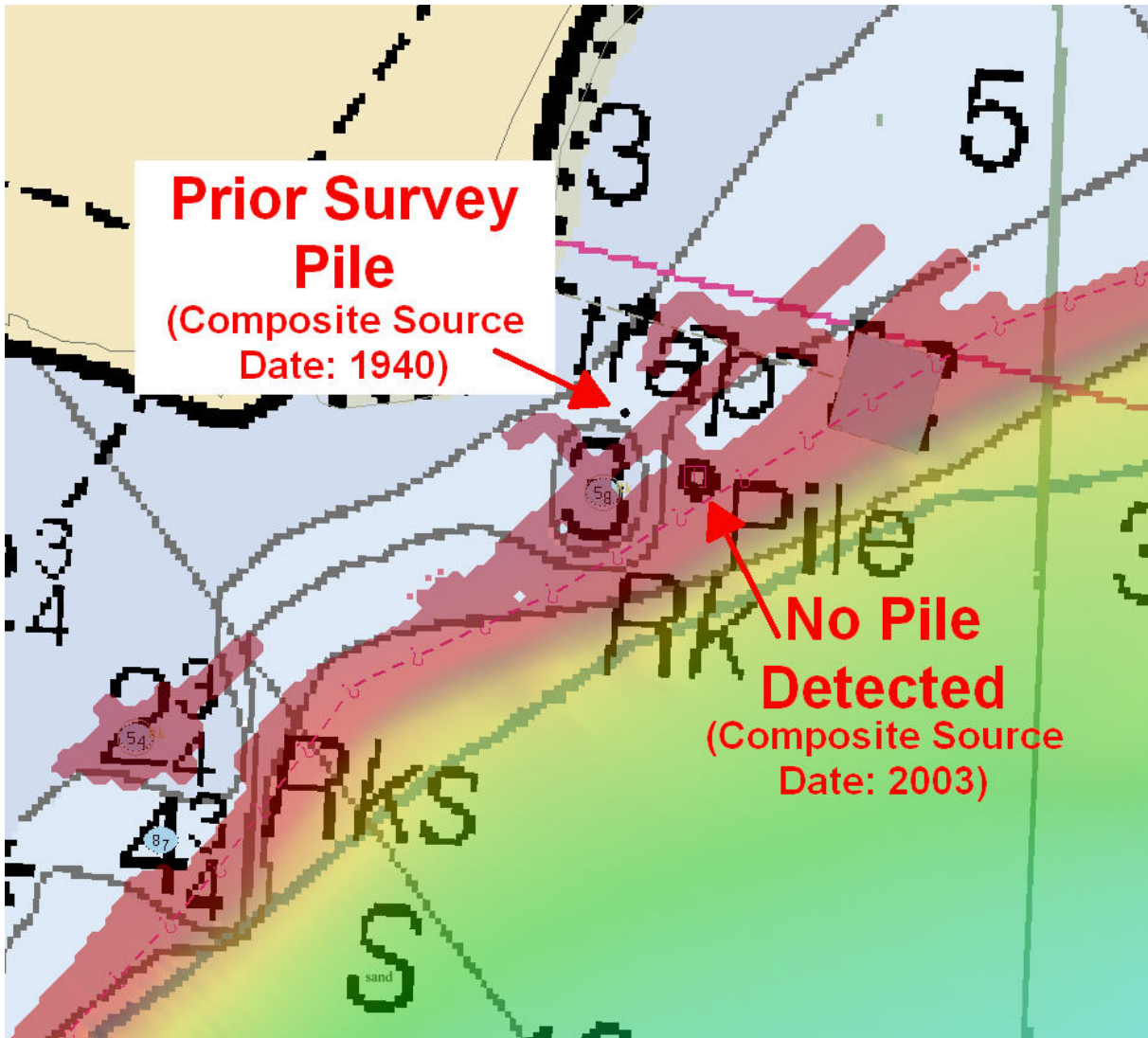


Figure 19: Pile locations 1940 and 2003.

West of Arch Point, near the far northwest limit of the survey, a charted (16549) islet was not detected; the hydrographer recommends deleting it from the chart (figure 20). The composite source layer shows another land area just inshore of this islet. Recommend charting as per lidar data.¹⁹

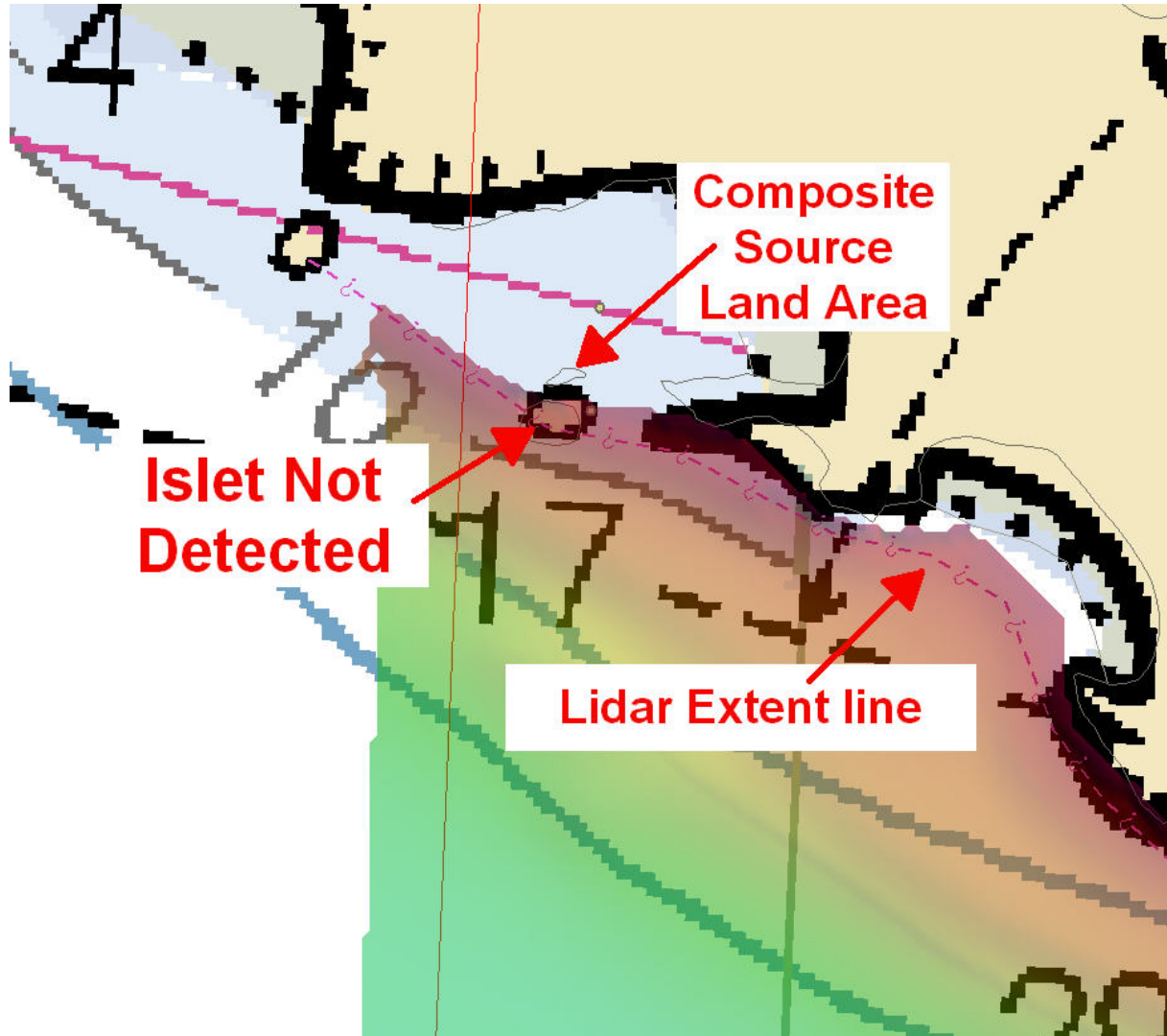


Figure 20: Islet recommended for deletion, and Land Area to be retained.

Chart 16540, Shumagin Islands to Sanak Islands (1:300,000):

Due to the small scale (1:300,000) of chart 16540, the usefulness of a comparison between survey soundings and charted depths is questionable. The above comparison of chart 16549 should take precedent.

No ENC Cell comparison was performed for H11901. Survey soundings were compared with raster chart 16549 (see above); ENC features have been addressed by file H11901_FieldVerifiedCompSource.hob.

The hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.²⁰

D.1.b. Dangers to Navigation

No dangers to navigation (DTONs) were found in survey H11901.²¹

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

Two (2) AWOIS items fall the within the survey limits of H11901. Both items are related to a Maritime Boundary Claim and were assigned for full investigation. Descriptions of each AWOIS item investigation are included in the Survey Feature Report in Appendix II.²²

Additional Items

No additional charted items were investigated and no other features were located on survey H11901.²³

D.2. Additional Results

D.2.a. Prior Survey Comparison

A prior survey comparison was neither required nor performed.

D.2.b. Shoreline Verification

Shoreline Source

The Pacific Hydrographic Branch (PHB) provided *Rainier* with .HOB files of all features detected by lidar from surveys H11436 and H11437, the lidar surveys that junction with H11901. The files were: H11436_LI_Features.hob and H11437_LI_Features.hob. Those features that fell within the H11901 survey area were “clipped” to the sheet limits and investigated if they fell outside the “good” lidar limit line. PHB also provided two .HOB files that included lidar features that were specifically recommended for field verification; these files were likewise clipped to H11901 sheet limits and used as the bases for investigation.

In addition, the composite source file 0_1P184R.000 was provided using data from the latest ENC's as well as prior survey features. Photogrammetric survey project GC10645 has been adequately applied to ENC's used in the composite source file. This source shoreline was used for orientation purposes in Hypack and Notebook and on printed boat sheets utilized for investigation of the LIDAR items discussed above.

Shoreline Verification

Traditional “limited shoreline verification” was not required for this survey, as the near-shore area was covered by junction lidar surveys H11436 and H11437. The following field procedures were followed:

- Lidar items selected for further investigation by H11901 were addressed by visual, Detached Position (DP), VBES, or MBES techniques as appropriate and feasible, near predicted low water. Note that some of these features were located in areas unsafe to approach and/or were considered insignificant to navigation, and were not further investigated.
- The composite source shoreline was used for orientation and navigation while transiting between assigned H11901 items.
- All new, charted, and AWOIS items within the limits of H11901 (i.e., offshore of the limits prescribed in the Letter Instructions and discussed in Section A.) were addressed when possible.

In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline, and transferred to the “remarks” attribute on the corresponding features in Notebook. DP forms are included in:

H11901\Descriptive_Report\Separates\IAcquisition_&_Processing_Logs\Detached_Positions.

All shoreline data is submitted in Caris Notebook .hob files. The session H11901_NTBK.wrk contains the files listed in table 6 below:

HOB File	Purpose and Contents
H11901_CompositeSource.hob	Original source data (0_1P184R.000) clipped to H11901 with all lidar investigation items added.
H11901_FieldVerifiedCompSource.hob	Field verified source features and shoreline, including Bottom samples and lidar investigation items.
H11901_Deleted.hob	Composite source and lidar investigation items that were deleted or modified.

Table 6: 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 CFF and charts as described above.²⁴

D.2.c. Aids to Navigation

Two (2) aids to navigation (ATONs) are within the limits of H11901 and were found to be correctly charted and were serving their intended purpose (figures 21 and 22).²⁵



Figure 21: Charted (16549) ATON, G “1”.



Figure 22: Charted (16549) ATON, “2”.

D.2.d. Overhead Features

There are no overhead features within the limits of survey H11901.²⁶

D.2.e. Submarine Cables and Pipelines

A charted (16549) cable area extends from southwest to northeast through H11901, however no evidence of submerged cables were apparent in the data. During survey observations it was observed that many vessels transiting the area travel within the charted cable area.²⁷

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11901, and none were observed to be operating in the area.²⁸

D.2.g. Bottom Samples

Seven (7) bottom samples were collected for survey H11901 and are included in the H11901_FieldVerifiedCompSource.hob file.²⁹

D.2.h. Other Findings

A magnetic disturbance was observed in the vicinity of Arch Point near Volcano Bay. Although differences of up to 5 degrees from the predicted variation were noted, precise magnetic measurements were not conducted around Arch Point. The hydrographer recommends retaining the local magnetic disturbance and associated note as charted.³⁰

E. APPROVAL

As Chief of Party, Field operations for hydrographic survey H11901 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual (April 2008 edition), Field Procedures Manual (May 2008 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through August 2008. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P184-RA-08	Nov. 26, 2008	N/CS34
Coast Pilot Report for OPR- P184-RA-08	TBD	N/CS26

Approved and Forwarded:



CAPT Donald W. Haines, NOAA
2008.12.29 11:09:49 -08'00'

Captain 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:

 Barry Jackson
2008.12.17 17:20:14 Z


B. Jackson
Senior Survey Technician, NOAA Ship *Rainier*.

Chief Survey Technician:

 James B Jacobson
I have reviewed this document
2008.12.29 07:46:16 -09'00'

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

Field Operations Officer:

 I have reviewed this document
2008.12.17 12:42:13 -08'00'

Lieutenant Charles Yoos, NOAA
Field Operations Officer

Revisions and Corrections During Office Processing and Certification

¹ Filed with project records.

² Concur.

³ H11901 junctions with survey H11900 to the west which as already been compiled, a common junction was made with this survey. H11901 also junctions with surveys H11902 to the south, H12076 to the north-east, and H12079 to the south-east which have not been compiled. A common junction was made to the south for the junction to H11902, though a common junction was not made on the east side so the eastern extent of H11901 should supersede H12076 and H12079 in the common areas.

⁴ Concur.

⁵ Concur.

⁶ Concur.

⁷ Tide note is appended to this report.

⁸ Concur, a 15 fathom sounding has been selected for charting at 55-14-42.9N, 161-49-37.8W.

⁹ A 28 fathom sounding has been selected for charting at 55-10-56.0N, 161-44-25.8W.

¹⁰ Soundings have been selected for this previously un-surveyed region at a density that emulates the sounding distribution of the rest of chart 16549.

¹¹ A 29 fathom sounding has been selected for charting at 55-12-08.0N, 161-51-40.9W.

¹² A 3 fathom rock has been selected for charting at 55-11-15.7N, 161-52-16.8W.

¹³ Concur.

¹⁴ Blue notes have been created recommending the removal of these two rocks.

¹⁵ AWOIS report is appended to this report.

¹⁶ Concur with clarification, a 3 fathom 2 foot sounding has been selected for charting at 55-12-55.3N, 161-53-05.7W.

¹⁷ Concur with clarification; the area of bathymetry overlapping the shoreline is much larger than the gap under the arched shoreline, thus the arch is not the cause of the improperly charted land extents. A blue note advising the land extents be adjusted per hydrography has been placed at Arch Pt.

¹⁸ Original pile at 55-12-59.0N, 161-52-59.1W has been selected for charting. The charted pile that was disproved at 55-12-56.1N, 161-52-53.8W is recommended to be removed.

¹⁹ Concur with clarification. Due to the overlap between surveys H11900 and H11901 this feature was addressed in H11900, however the actions chosen during the compilation of H11900 are in agreement with the recommendations made by the field.

²⁰ Concur.

²¹ Concur.

²² AWOIS report appended to this report.

²³ Concur.

²⁴ Concur with clarification; the submitted .HOB files were used in the compilation of H11901_CS.000. During compilation some modifications were made due to chart scale. Chart as per H11901_CS.000.

²⁵ Chart per latest ATONIS information.

²⁶ Concur.

²⁷ Retain cable area as charted.

²⁸ Concur.

²⁹ Concur with clarification, bottom samples have been imported into H11901_CS.000.

³⁰ Concur.

H11901 Feature Report

Registry Number: H11901
State: Alaska
Locality: Pavlof Islands
Sub-locality: Bluff Point to Arch Point
Project Number: OPR-P184-RA-08
Survey Date: 08/06/2008

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16549	15th	07/01/2003	1:80,000 (16549_1)	USCG LNM: 04/01/2008 (04/15/2008) NGA NTM: 01/21/2006 (04/19/2008)
16540	12th	01/01/2005	1:300,000 (16540_1)	[L]NTM: ?
16011	37th	11/01/2007	1:1,023,188 (16011_1)	[L]NTM: ?
16006	35th	04/01/2008	1:1,534,076 (16006_1)	[L]NTM: ?
513	7th	06/01/2004	1:3,500,000 (513_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	Sounding	4.58 m	55° 12' 17.7" N	161° 54' 24.0" W	53669
1.2	Sounding	16.39 m	55° 13' 39.2" N	161° 52' 32.8" W	53691

1 - AWOIS Features

1.1) Profile/Beam - 1/1 from H11901 / 1103_nonechosounder_dp / 2008-219 / h11901_dp_1103_219

Primary Feature for AWOIS Item #53669

Search Position: 55° 12' 16.1" N, 161° 54' 23.2" W
Historical Depth: [None]
Search Radius: 100
Search Technique: [None]
Technique Notes: VERIFY LOCATION OF POINT IN SUPPORT OF MARITIME BOUNDARY CLAIM

History Notes:

H03305(1925)--DIGITIZED; A SMALL POINT IN THE VICINITY OF ARCH POINT IN SCALED (CHART 16549) POSITION LAT. 55/12/16 N LONG. 161/54/23 W (NAD83) CLOSING LINE POINT NEEDS TO BE VERIFIED FOR A MARITIME BOUNDARY CLAIM, WHICH WILL FORM THE INNER LIMIT OF THE TERRITORIAL SEA AREA. THE SOURCE (CHART 16549) INDICATES THAT THE FEATURE IS A SMALL PENINSULA-LIKE AREA. ENTERED 5/08 BY RES.

Survey Summary

Survey Position: 55° 12' 17.7" N, 161° 54' 24.0" W
Least Depth: 4.58 m (= 15.01 ft = 2.502 fm = 2 fm 3.01 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2008-219.21:02:59.000 (08/06/2008)
DP Dataset: H11901 / 1103_nonechosounder_dp / 2008-219 / h11901_dp_1103_219
Profile/Beam: 1/1
Charts Affected: 16549_1, 16540_1, 16011_1, 16006_1, 500_1, 513_1, 530_1, 50_1

Remarks:

A small point in the vicinity of Arch Point in scaled chart 16549. Investigated as part of AWOIS 53699, Maritime boundary Claim item. DP taken on the seaward-most corner of the point. Charted land area/coastline differs somewhat from what was observed in the field.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11901/1103_nonechosounder_dp/2008-219/h11901_dp_1103_219	1/1	0.00	000.0	Primary
OPR-P184-RA-08	AWOIS # 53669	50.03	343.6	Secondary (grouped)

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Land area (LNDARE)
Attributes: SORDAT - 20080811
SORIND - us,us,graph,H11901
STATUS - 1:permanent

Feature Images

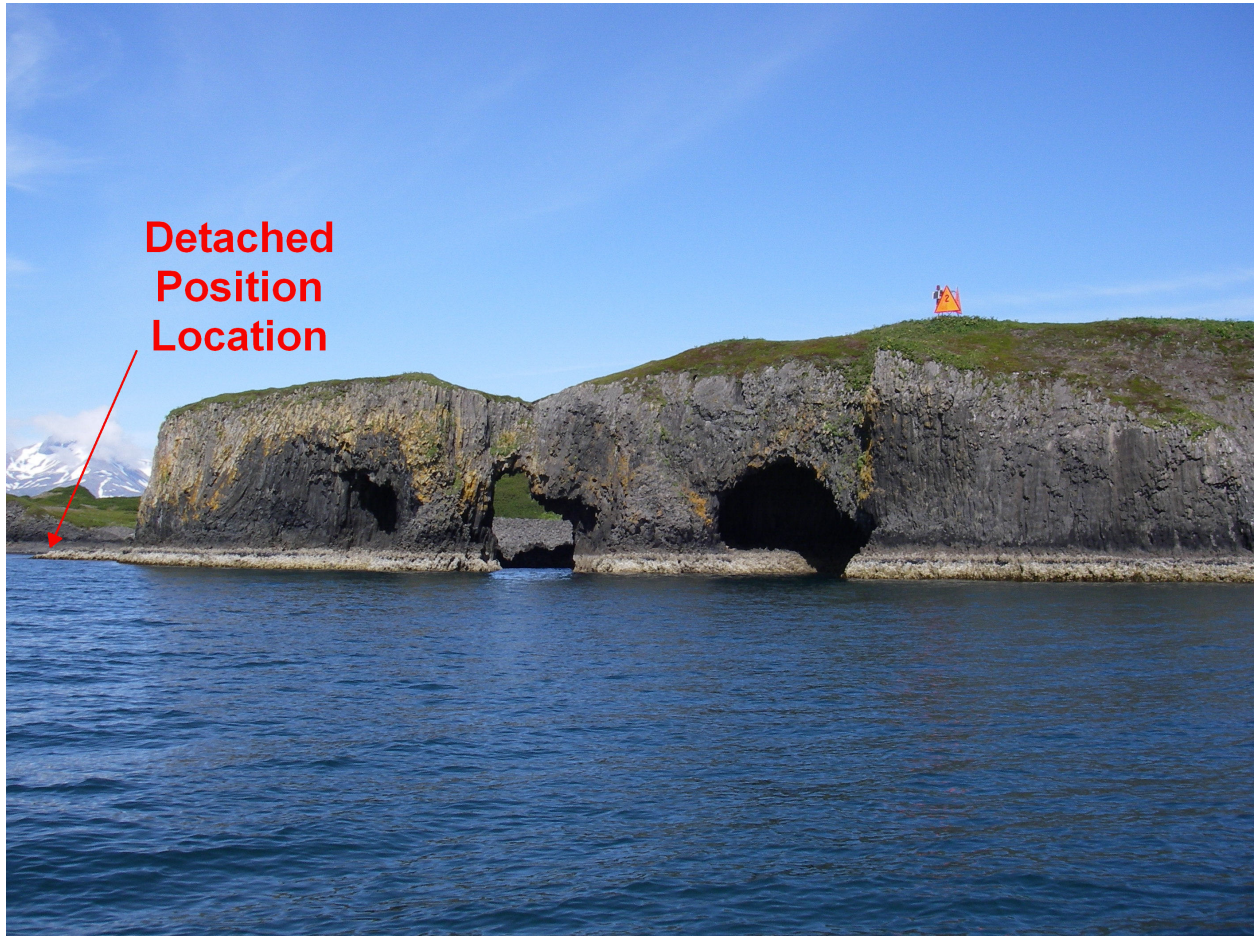


Figure 1.1.1



Figure 1.1.2

1.2) Profile/Beam - 2/1 from H11901 / 1103_nonechosounder_dp / 2008-219 / h11901_dp_1103_219

Primary Feature for AWOIS Item #53691

Search Position: 55° 13' 40.4" N, 161° 52' 23.2" W
Historical Depth: [None]
Search Radius: 100
Search Technique: [None]
Technique Notes: UPDATE POSITION AND HEIGHT IN SUPPORT OF MARITIME BOUNDARY CLAIM.

History Notes:

H11436(2005)LIDAR--THIS IS A CHARTED ISLET IN THE VICINITY OF LONG JOHN LAGOON IN SCALED (CHART 16549) POSITION LAT. 55/13/40 N LONG. 161/52/23 W (NAD83) BASELINE POINT NEEDS TO BE REPOSITIONED FOR A MARITIME BOUNDARY CLAIM. THE SOURCE (CHART 16549) INDICATES THAT THE FEATURE IS A ISLET; THIS ITEM WAS NOT IDENTIFIED BY THE 2005 LIDAR SURVEY, BUT THAT COULD BE DUE TO SPOTTY COVERAGE IN THE REGION. A PREVIOUS SURVEY, H06593, INDICATES THE PRESENCE OF AN ISLET 6/08 RES).

Survey Summary

Survey Position: 55° 13' 39.2" N, 161° 52' 32.8" W
Least Depth: 16.39 m (= 53.78 ft = 8.963 fm = 8 fm 5.78 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2008-219.22:01:51.000 (08/06/2008)
DP Dataset: H11901 / 1103_nonechosounder_dp / 2008-219 / h11901_dp_1103_219
Profile/Beam: 2/1
Charts Affected: 16549_1, 16540_1, 16011_1, 16006_1, 500_1, 513_1, 530_1, 50_1

Remarks:

Rocky point of a reef-like feature in vicinity of, what is described (AWOIS item 53691) as a charted islet although it is shaded as covering and uncovering. It was observed as the only prominent rocky area off of a sand beach. No islet seen. DP is on the seaward most extent of what appears to be a basalt reef off a black sand beach. Distance shot with laser. Investigated as part of AWOIS 53691, Maritime Boundary Claim item.

Feature Correlation

Address	Feature	Range	Azimuth	Status
H11901/1103_nonechosounder_dp/2008-219/h11901_dp_1103_219	2/1	0.00	000.0	Primary
OPR-P184-RA-08	AWOIS # 53691	161.11	261.5	Secondary (grouped)

Hydrographer Recommendations

Delete charted (16549) "islet."

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: COLOUR - 2:black
NATQUA - 8:volcanic
NATSUR - 9:rock
SORDAT - 20080811
SORIND - us,us,graph,H11901
WATLEV - 4:covers and uncovers

Feature Images



Figure 1.2.1



Figure 1.2.2



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 15, 2008

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P184-RA-2008
HYDROGRAPHIC SHEET: H11901

LOCALITY: Bluff Point to Arch Point, Pavlof Islands, AK
TIME PERIOD: June 25 - August 12, 2008

TIDE STATION USED: 945-9881 King Cove, AK
Lat. 55° 03.6'N Long. 162° 19.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.876 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P184-RA-2008, H11901, during the time period between June 25 and August 12, 2008.

Please use the zoning file "P184RA2008CORP" submitted with the project instructions for Pavlof Islands, AK. Zones SWA218 & SWA205 are the applicable zones for H11901.

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).

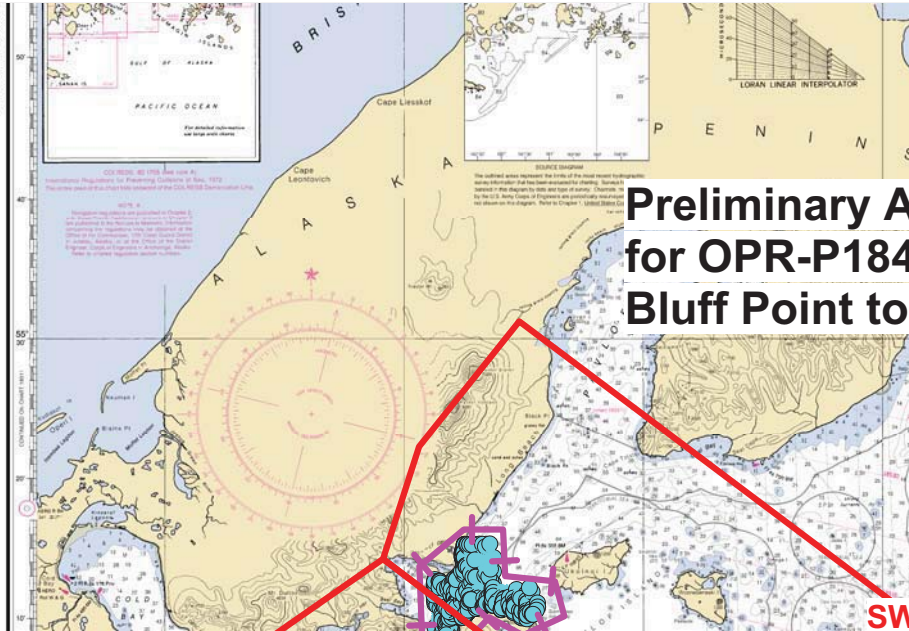
Peter J. Stone

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: 2008.06.30 15:50:08 -04'00'

CHIEF, PRODUCT AND SERVICES DIVISION



1:6 OVERPRINTED

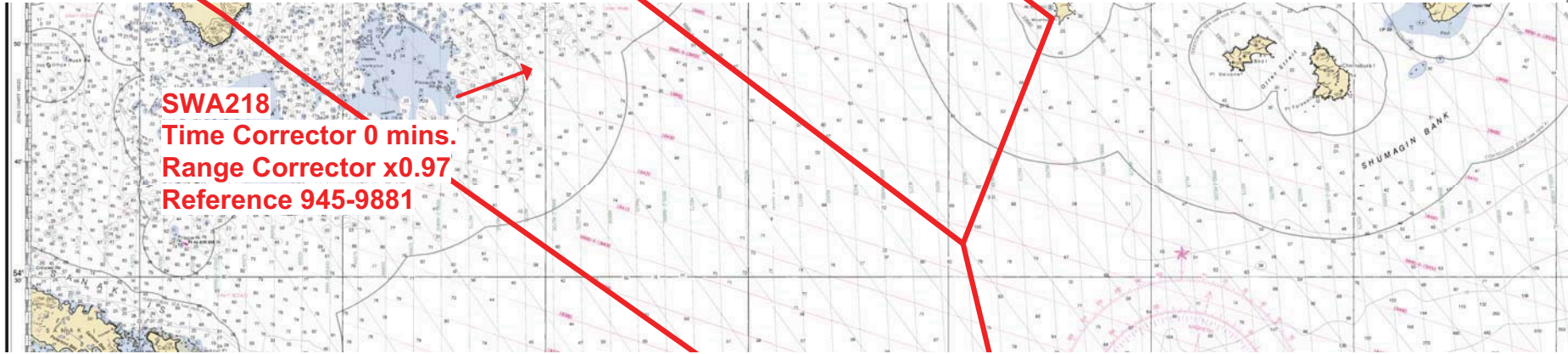


**Preliminary As Final Tidal Zoning
for OPR-P184-RA-2008, H11901
Bluff Point to Arch Point, Pavlof Islands, AK**

SWA205
Time Corrector -6 mins.
Range Corrector x1.01
Reference 945-9881

945-9881 KING COVE

SWA218
Time Corrector 0 mins.
Range Corrector x0.97
Reference 945-9881



H11901 HCell Report
Peter Holmberg, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11901 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.
HCell Reference Guide: Version 2.0, 22 February, 2010.

2. Compilation Scale

Depths and features for HCell H11901 were compiled to the largest scale raster chart shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16549	1:80,000	16th	03/01/2010	05/01/2010

The following ENC's were also used during compilation:

Chart	Scale
US4AK55M	1:80,000

3. Soundings

In CARIS BASE Editor a survey-scale sounding (SOUNDG) feature object layer was built from a 8-meter Combined Surface from multibeam and singlebeam data from H11901 and 3-meter Surfaces from lidar data from H11436 and H11437. 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	100	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.

4. Depth Contours

Depth contours at the intervals on the largest scale chart are included in the *_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in Fathoms from Chart 16549	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 H11901_SS.000
0	0.000	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
30	54.864	56.236	30.750	30
50	91.44	92.8116	50.750	50

With the exception of zero contours included in the *_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the *_CS file and soundings in the *_SS have been. This may result in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

5. Meta Areas

The following Meta object areas are included in HCell H11901:

M_QUAL

The Meta area objects were constructed on the basis of the limits of the hydrography. H11901 contains four separate M_QUAL objects. One large area depicting data sourced from H11901, two smaller areas depicting data sourced from lidar survey H11436, and one small area depicting data sourced from lidar survey H11437, see figure 1 from H11901 Descriptive Report.

6. Features

Features addressed by the field units are delivered to PHB where they are deconflicted against the hydrography and the largest scale chart. These features, as well as features to be retained from the chart and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7.S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Notes to the MCD chart Compiler
LNDARE	Islets retained from Lidar
LNDELV	Elevation of islands
M_QUAL	Data quality Meta object
PILPNT	Pile
SBDARE	bottom samples
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features
WEDKLP	New and retained kelp

The *_SS HCell contains the following Objects:

DEPCNT	Generalized contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

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

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

BASE Editor and S-57 Composer Units:

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

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

10. QA/QC and ENC Validation Checks

H11901 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

H11901_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H11901_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H11901_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11901_outline.gml	Survey outline
H11901_outline.xsd	Survey outline

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	Creation of soundings and bathy-derived features, 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:

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

APPROVAL SHEET
H11901

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.