

H11677

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-10-03-07

Registry No. H11677

LOCALITY

State Alaska

General Locality Approaches to Sitka

Sublocality West Crawfish Inlet

2007

CHIEF OF PARTY

..... Commander Guy T. Noll, 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;">H11677</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: N/A</p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Approaches to Sitka</u></p> <p>Sub-Locality <u>West Crawfish Inlet</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>4/20/2007 - 6/2/2007</u></p> <p>Instructions dated <u>3/28/2007</u> Project No. <u>OPR-O112-RA-07</u></p> <p>Vessel <u>RA5 (1006), RA6 (1015 Elac1180), RA4 (1016), RA3 (1102), RA1 (1101), RA2 (1103)</u></p> <p>Chief of party <u>Commander Guy T. Noll, NOAA</u></p> <p>Surveyed by <u>RAINIER Personnel</u></p> <p>Soundings by <u>Reson SeaBat 8101, Seabeam/Elac 1180, Reson SeaBat8125, Knudsen 320M</u></p> <p>SAR by <u>Anthony Lukach</u> Compilation by <u>Anthony Lukach</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Projection (zone #8)</u></p> <p><u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were generated during office processing. Page numbering may be interrupted or non sequential.</u></p>	

Descriptive Report to Accompany Hydrographic Survey H11677

Project OPR-O112-RA-07
Approaches to Sitka, Alaska
West Crawfish Inlet
Scale 1:10,000
April – June 2007
NOAA Ship RAINIER (s221)
Chief of Party: Commander Guy T. Noll, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-RA-07 dated March 28, 2007 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area includes the approaches to Sitka, with a sub-locality of West Crawfish Inlet. This survey corresponds to sheet “A” in the sheet layout provided with the Letter Instructions. OPR-O112-RA-07 responds to a request from The USCG 17th District Aids to Navigation Branch. They have identified that the route south of Sitka “along a protected passage to Necker Bay and Crawfish Inlet, is seeing increased use by commercial fishing vessels, commercial charter vessels and recreational boaters.” As tour companies respond to the growing numbers of visitors that are looking for the “real Alaska”, this area will see increased passenger vessel traffic in the near future.

Complete multibeam echosounder (MBES) coverage was obtained in the survey area in waters 8 meters and deeper. In depths less than 8 meters additional MBES coverage was acquired to obtain least depths over significant features or shoals, as appropriate for this survey. Vertical beam echo sounder (VBES) data were acquired in depths from approximately 4 to 20 meters in applicable areas to define the navigable area limit, aid in the planning of SWMB data acquisition, and provide inshore bathymetry in navigationally significant areas. Total mileage acquired by each vessel and system is reference in Table 1.

Data Acquisition Type	Hull Number with Mileage (nm)						Total
	1101	1103	1006	1015	1016	1021	
VBES (mainscheme)	-	14.48	-	-	-	-	14.48
MBES (mainscheme)	-	-	59.14	-	11.47	21.79	92.93
SSS (mainscheme)	-	-	-	-	-	-	-
Crosslines	-	-	-	8.02	-	-	8.02
Developments	0.15	-	-	-	8.33	-	8.48
Shoreline	24.91	2.23	-	-	-	-	27.14
Bottom Samples	1	7	2	-	-	-	10
Total Number of Items Investigated	18	-	-	-	-	-	18
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	3.732

Table 1: Statistics for survey H11677

Data acquisition was conducted from April 20 to June 2, 2007 (DN 110 to 153).

¹NOS Hydrographic Surveys Specifications and Deliverables (April 2007), OCS Field Procedures Manual for Hydrographic Surveying (March 2007), and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

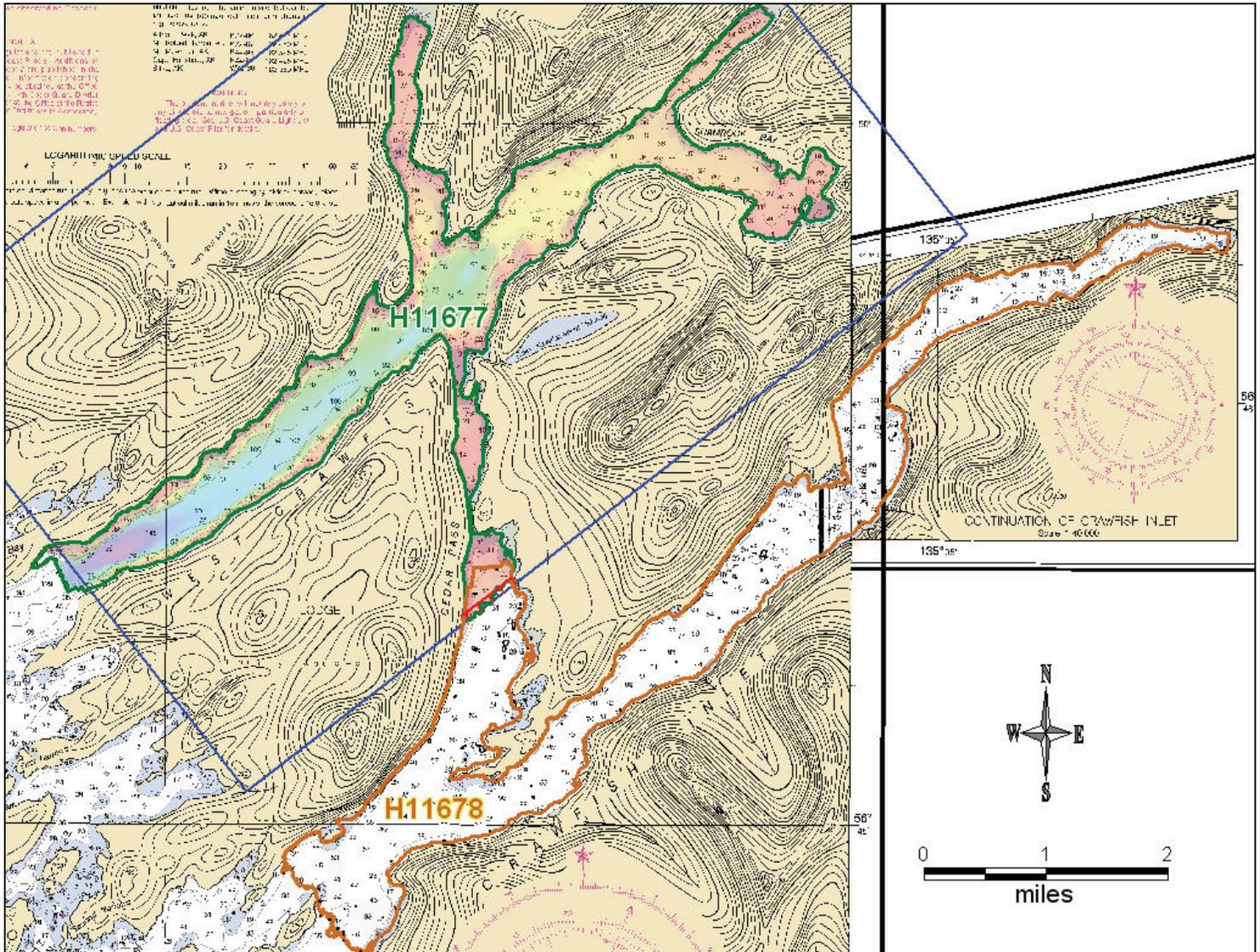


Figure 1. H11677 Survey Limits and junctions overlaid on chart 17326.

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-O112-RA-07 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 TCARI 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	Vertical Beam Echosounder Side Scan Sonar Detached Positions Bottom Samples
1103	RA-2	Vertical Beam Echosounder Bottom Samples
1021	RA-3	Multibeam Echosounder
1016	RA-4	Multibeam Echosounder
1006	RA-5	Multibeam Echosounder Bottom Samples
1015	RA-6	Multibeam Echosounder

Table 2. Data Acquisition Vessels for H11677.

Sound speed profiles were measured with SEACAT SBE-19 and 19+ profilers in accordance with the Specifications and Deliverables.

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Vertical Beam Echo Sounder (VBES) mainscheme hydrography for survey H11677 totaled 14.48 nautical miles. The VBES shoreline buffer acted as a crossline and intersected the majority of mainscheme VBES lines. Crossline and mainscheme bathymetry were manually compared in CARIS HIPS subset mode. Crosslines generally agreed within 0.5 to 1 meter of mainscheme hydrography.

Multi-Beam Echosounder (MBES) crosslines totaled 8.02 nautical miles, comprising 8.6% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode and agreed well with differences averaging approximately 0.5 meter or less.

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 2007 RAINIER Hydrographic System Readiness Review package submitted with this survey.²

Junctions

None of the assigned junction surveys adjoin survey H11677. H11677 did junction with survey H11678, Crawfish Inlet (see Figure 1). The survey junction in the Cedar Pass area was manually compared using CARIS subset mode and agreed well with no discernable differences.)³

Data Quality Factors

Positioning Problems

The topography of the survey area was steep and mountainous. This proved to be problematic in maintaining differential correctors and sufficient satellite constellations, as well as presenting some multipath effects. The issue was mostly compensated for in the field without any major data representation errors. When position information was lost, the survey launch would move to a more open area to reacquire satellites, then return to the work area and continue acquiring data. The one exception is the VBES shoreline buffer which experienced a number of position losses due to staying inshore for extended periods of time. These losses were seen mostly within the smaller bays at the head of W. Crawfish Inlet. Small outages were modified during post processing using the “reject with interpolation” function in the CARIS navigation editor. These areas were 100 meters or less and the launch crew did not note any hazards to navigation that would warrant re-running the small portions of the lines. The more extensive position losses received no modifications during post processing and appear as gaps in the shoreline buffer line (see Figure 2.) In all areas where outages resulted in gaps in coverage, the multibeam data acquired in the area proved to be sufficient in reaching the inshore coverage requirements.⁴

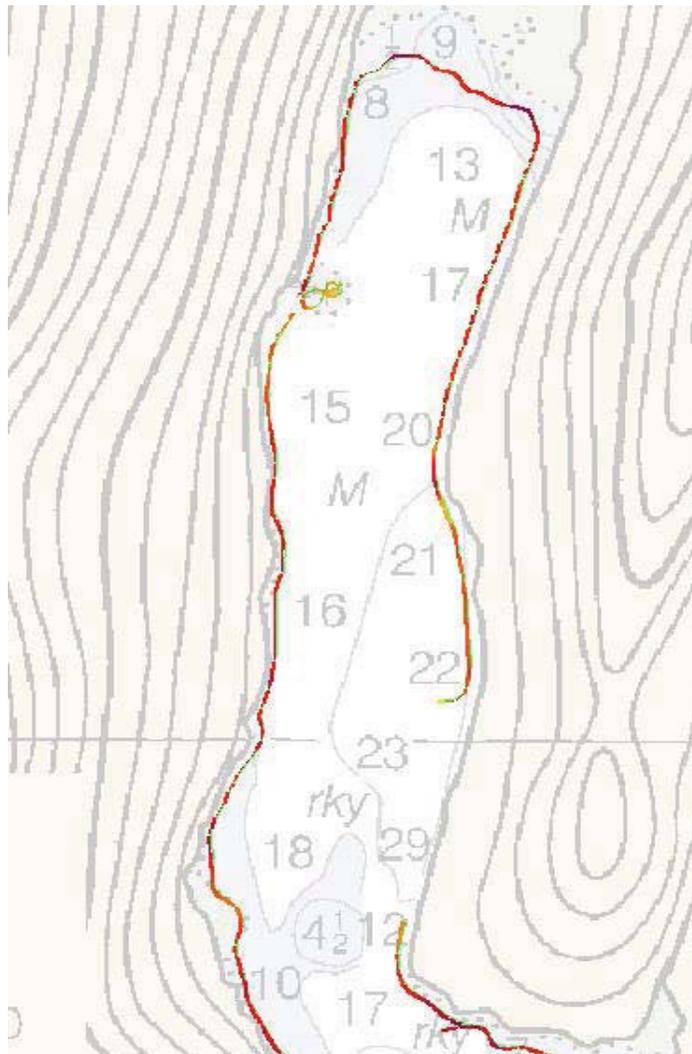


Figure 2: Position loss in VBES H11677 shoreline buffer

Sound Speed Artifacts

Due to a high amount of freshwater runoff and the effects of tidal currents in some of the areas within this survey, a sharp demarcation of water masses was observed at times in the field. This problem was primarily contained within the smaller bays and inlets within West Crawfish Inlet and proved to be problematic in the acquisition and application of sound speed correctors. After correction for sound speed in HDCS, some lines still exhibited the characteristic "frowns" indicative of sound speed errors (see figure 3). In an attempt to compensate for these sound speed problems, a sheet wide concatenated SVP file was compiled from all casts taken during the survey. This was then applied to the entire survey area using the nearest in distance within time function. The time range was typically set to a 3 hour period. Those areas that did not have a cast within 3 hours were processed with nearest in distance within 4 hours. Sound speed casts were taken at a minimum of every 4 hours. Despite the best efforts of the Hydrographer to conduct sufficient sound speed casts distributed both spatially and temporally, and to correct for sound speed errors in post processing through methods previously mentioned, sound speed errors were still noticeable in some regions. The observed sound speed errors affected the BASE surface in areas with up to 0.5m distortion in the surface near the outer beams. To compensate, the Hydrographer, where possible, rejected soundings obviously in error on the outer beams. A few small areas within the BASE surfaces still show sound speed artifacts, primarily in the 0.5m to 1m resolution surfaces. The limited number of remaining artifacts are within the Specification and Deliverables maximum allowable error of 0.3m plus 0.5% of the water depth.⁵

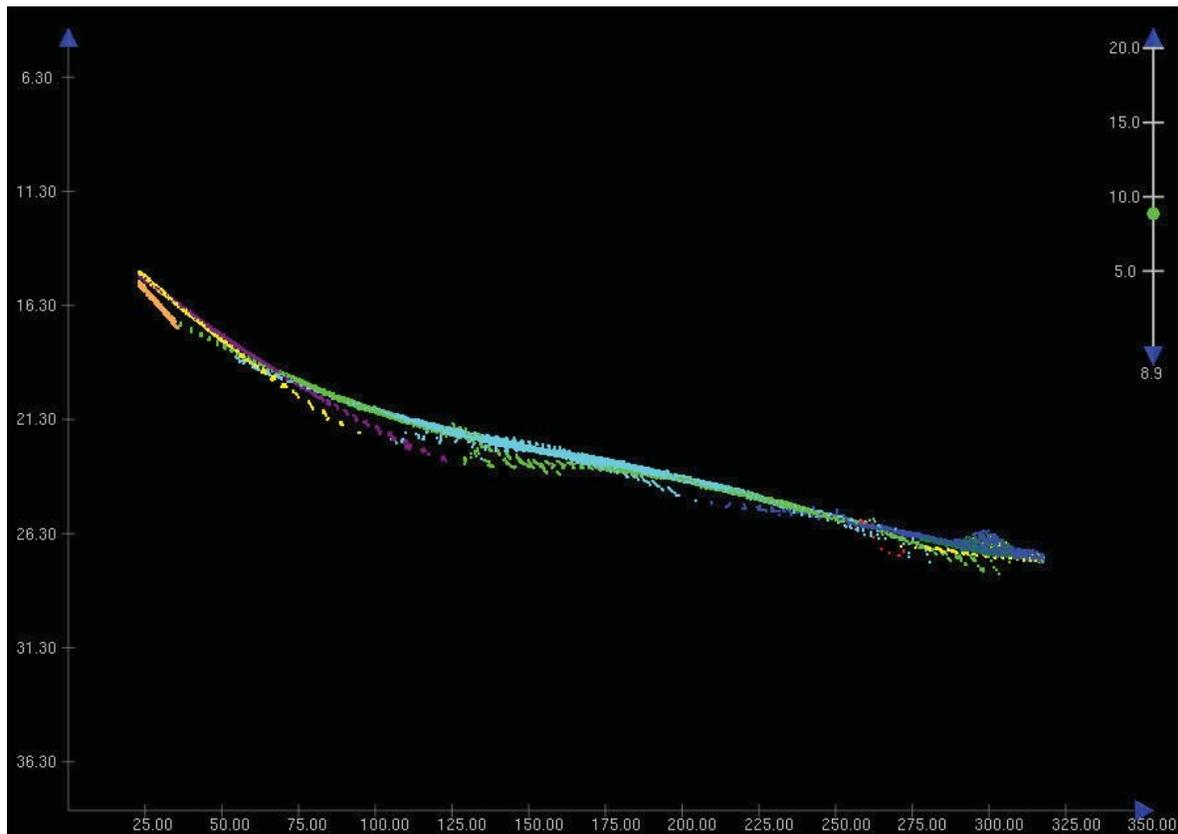


Figure 3. Sound velocity errors in H11677 as seen in subset editor.

Time Offset

All data acquired with Launch 1101 (RA-1) on days 122 and 123 were logged with the incorrect time. The problem occurred after the time zone on the acquisition computer on Launch 1101 (RA-1) was mistakenly set to London Greenwich Zone Time, which was set to observe daylight savings, rather than Monrovia/Casablanca GMT, which does not. In addition, a new version of Hypack (version 6.2A) had been loaded which did not default to synchronizing the clock with GPS. As a result, all data logged on these days received a time stamp that was one hour ahead of UTC GMT time. The clock was corrected after completing single beam acquisition in survey H1677. Affected data was corrected with the “Linear Adjustment” utility in the HSTP Post Acquisition Tools suite and shifted back 3600 seconds (1 hour). Detached Positions (DPs) acquired with Launch 1101 (RA-1) on these days were fixed manually with Pydro’s DP editor.

After the hour offset was corrected, the effected data were re-tide corrected, re-svp corrected and re-merged. The effected lines files and DP’s still bear the incorrect time in the file name. For example, the CARIS data from line 000_1915 begins at time 1815. No original data was altered such that the paper acquisition logs and paper DP forms still bear the incorrect times, and all raw data contain the incorrect time. If data from Launch 1101 (RA-1) from DNs 122 and 123 are reconverted or reimported the time error will return.

Holidays

One significant holiday is located near the sheet limit in the Cedar Pass area (see figures 4a and 4b.) When compared with the junctioning survey in Crawfish Inlet, this gap was shown to be covered by the MBES data for sheet H11678. Because the holiday is covered by the data in the adjoining sheet, no additional lines were run in H11677 to cover this area.⁶

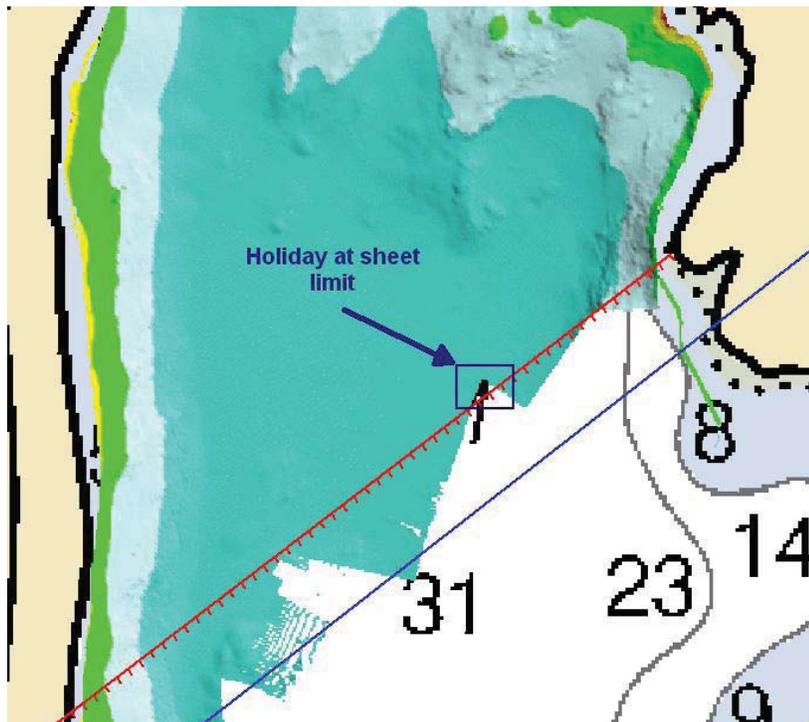


Figure 4a: Holiday shown near H11677 survey limit

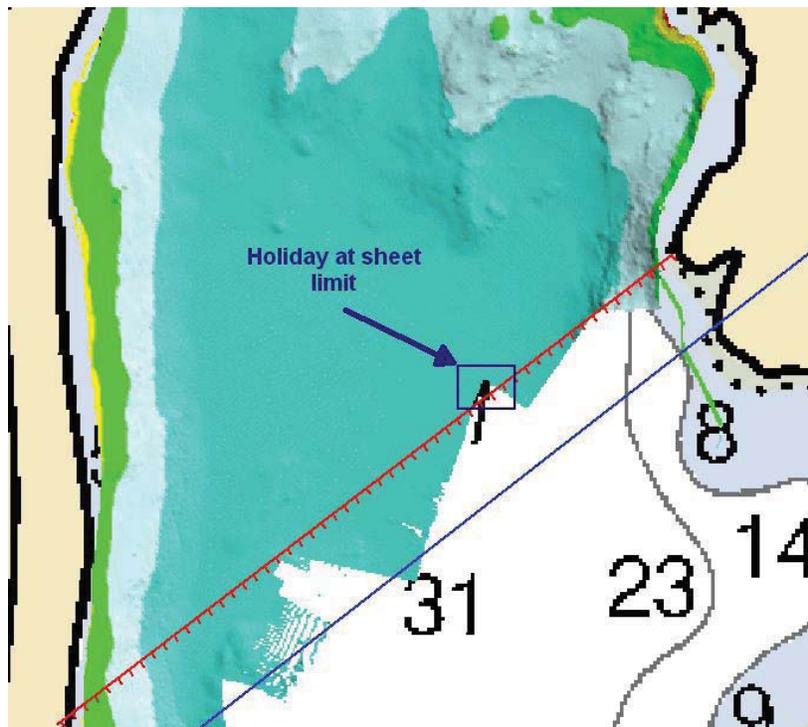


Figure 4b: H11678 data coverage over holiday

B3. Data Reduction

Data reduction procedures for survey H11677 conform to those detailed in the *OPR-O112-RA-07 DAPR*.

B4. Data Representation

Many BASE surfaces were used in processing H11677. Due to the steep cliffs seen in the majority of the survey area, each field sheet required multiple BASE surfaces to adequately portray the varying depth ranges. Final BASE surface resolutions and depth ranges were set to most adequately display relevant features, with field sheets being smaller than 25×10^6 nodes. Depth ranges were primarily set in accordance with the Table 3 below with a few exceptions. The first is a small field sheet that was created over Cedar Pass with a 0.25m resolution in an attempt to decrease the amount of designated soundings. This area was particularly shallow and rocky and was not being accurately represented at 0.5m resolution. The second case where resolution differed was in field sheet F. This field sheet encompassed the deep southern portion of the Inlet. The shoreline in the area was comprised of very steep cliffs had very limited shoreline features. In this area, the highest resolution was set to 1m, and was used for depths of 0 to 31.5m. An additional field sheet was created with a 2m BASE surface resolution as well as an uncertainty surface that included only the shoreline buffer. This was used in the H11677_Notebook.wrk session to provide guidance and reference for areas that require modifications up to the acquired buffer line. The submission Field Sheet and BASE Surface structure is shown in Figures 5 and 6.

Depth Range of Finalized Surface	Resolution
0.0 – 16.0 m	0.5 m
14.0 – 31.5 m	1 m
28.5 – 63 m	2 m
57 – 158 m	5 m
> 143 m	10 m

Table 3: Depth ranges and resolution of BASE surfaces

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

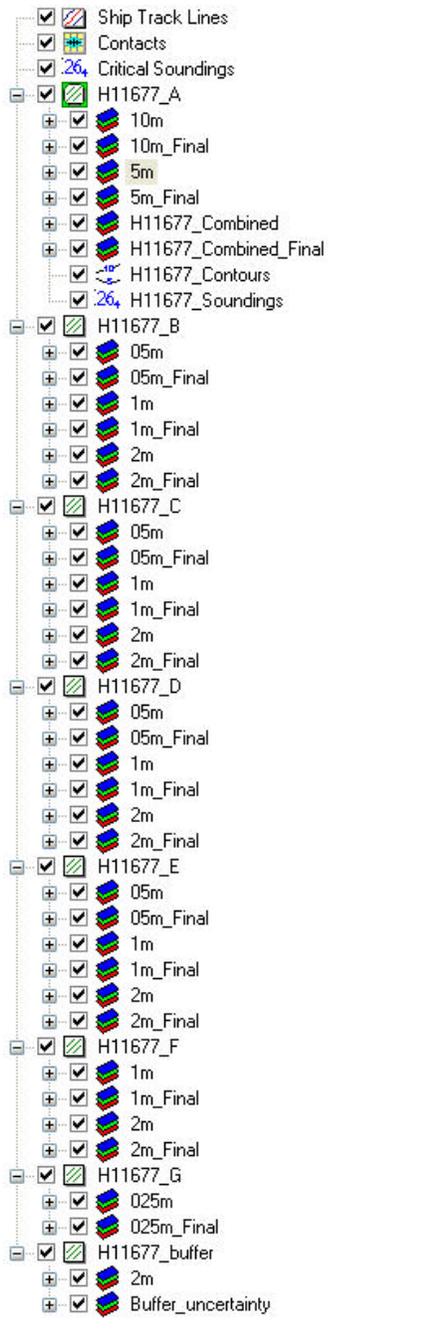


Figure 5: Field sheets and BASE surfaces submitted with H11677.

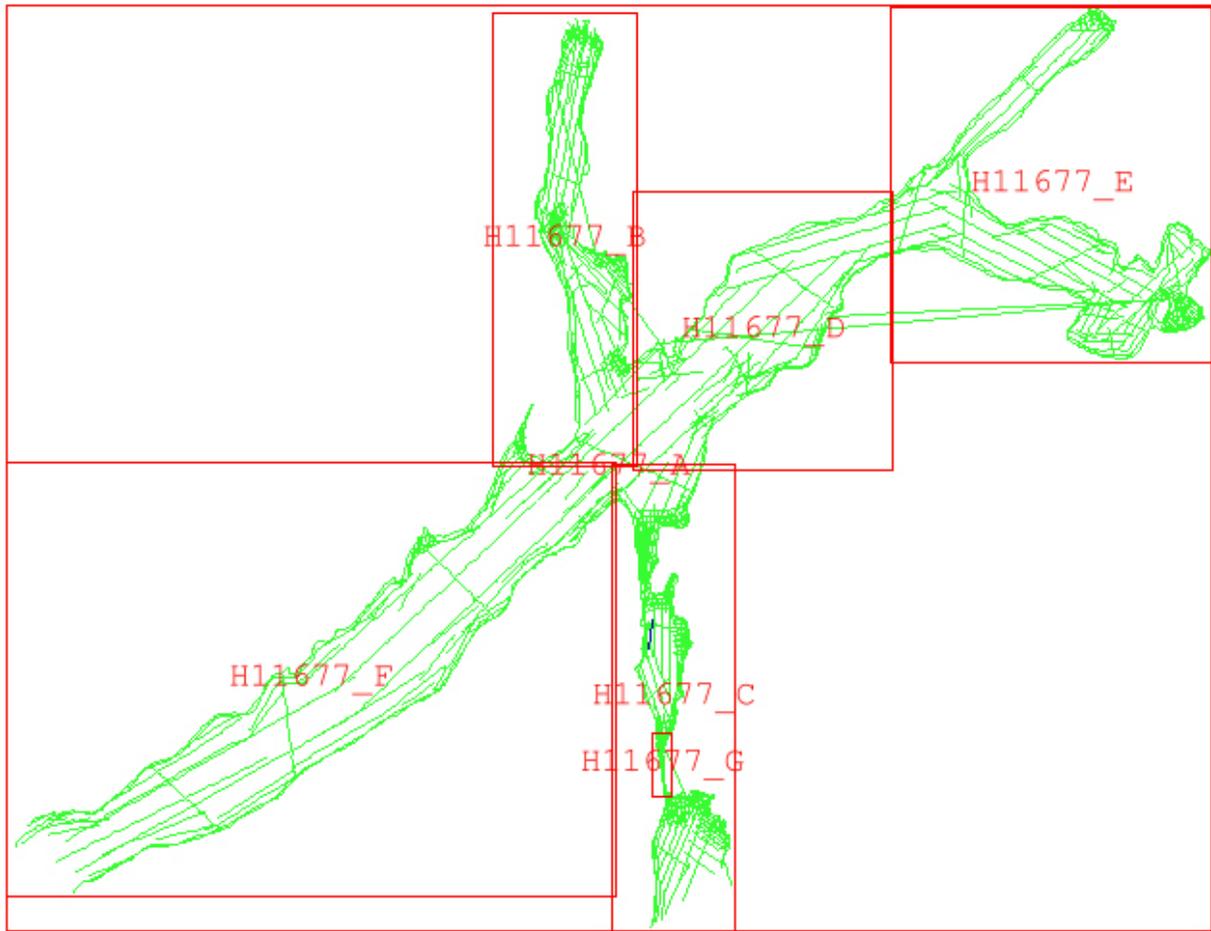


Figure 6: Layout of field sheets for H11677.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11677 can be found in the *OPR-O112-RA-07 Horizontal and Vertical Control Report*, submitted under separate cover.⁷ A summary of horizontal and vertical control for this survey follows.

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 4.

Location	Frequency	Operator	Distance	Priority
Biorka Island	305 KHz	USCG	12nm	Primary
Level Island	295 KHz	USCG	72nm	Secondary

Table 4: Differential Corrector Sources for H11677.

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 H11677.

RAINIER personnel installed a Sutron 8210 “bubbler” tide gauge at the following subordinate station in accordance with the Letter Instructions. This station is described in detail in the *OPR-O112-RA-07 Horizontal and Vertical Control Report*.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Dorothy Cove, AK	945-1376	30-day	April 18, 2007	July 22, 2007

Table 5: Tide Stations installed by RAINIER personnel for H11677

All data were reduced to MLLW using **final verified TCARI water levels** using TCARI file O112RA2007-TACRI-F.tc and stations Sitka, AK (945-1600) and Dorothy Cove, AK (945-1376) using the tide files 9451376_Verified_MSL.txt and 9451600_Verified_MSL.txt.

The request for Final Approved Water Levels for H11677 was submitted to CO-OPS on September 6, 2007, and the Final Tide Note was received on September 27, 2007. This documentation is included in Appendix IV.⁸

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11677 was compared with the following chart:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
17326	1:40,000	15 th Ed, June 2006	3/21/2007

Table 6: Charts compared with H11677

A chart comparison was made to the largest scale raster chart of the survey area in accordance with verbal instructions received from the Chief, Hydrographic Surveys Division Operations Branch, at the 2007 Field Procedures Workshop.

Chart 17326

Soundings from survey H11677 generally agreed within 1 to 3 fathoms of current charted depths. In rare cases, discrepancies of 10 fathoms or more were seen. The larger areas of survey disagreement were seen primarily in areas 20 fathoms and deeper, and tended to be deeper than currently charted. In many instances, survey H11677 revealed shoaler soundings between charted depths. This can be attributed to increased bottom coverage using SWMB methods.⁹

The Hydrographer recommends that current survey soundings supersede all prior survey and charted depths in the common area.¹⁰

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of final approved water levels.¹¹

D.1.b. Dangers to Navigation

Two (2) Dangers to Navigation (DTONs) were found on survey H11677 and reported to the Marine Chart Division via email on 5/12/2007. The original DTON submission package is included in Appendix IV.¹² Descriptions of each DTON are included in the Survey Feature Report in Appendix II.¹³

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

One (1) AWOIS item fell within the survey limits of H11677. The item was assigned for full investigation and was described as a 35 foot fishing vessel, sunk in 125 ft of water. The item was found approximately 185m SW of the current charted position (see figure 7). Although this wreck falls outside the assigned search radius, in all other ways it meets the description provided by the AWOIS database. The Hydrographer recommends changing the position of the wreck to reflect the most current data. A designated sounding and side scan sonar contact were selected in CARIS HIPS/SIPS to represent current position and least depth, and were imported to the Notebook table H11677_Pydro_Updates.hob. In addition, a description of the AWOIS item investigation is included in the Survey Feature Report in appendix II.¹⁴

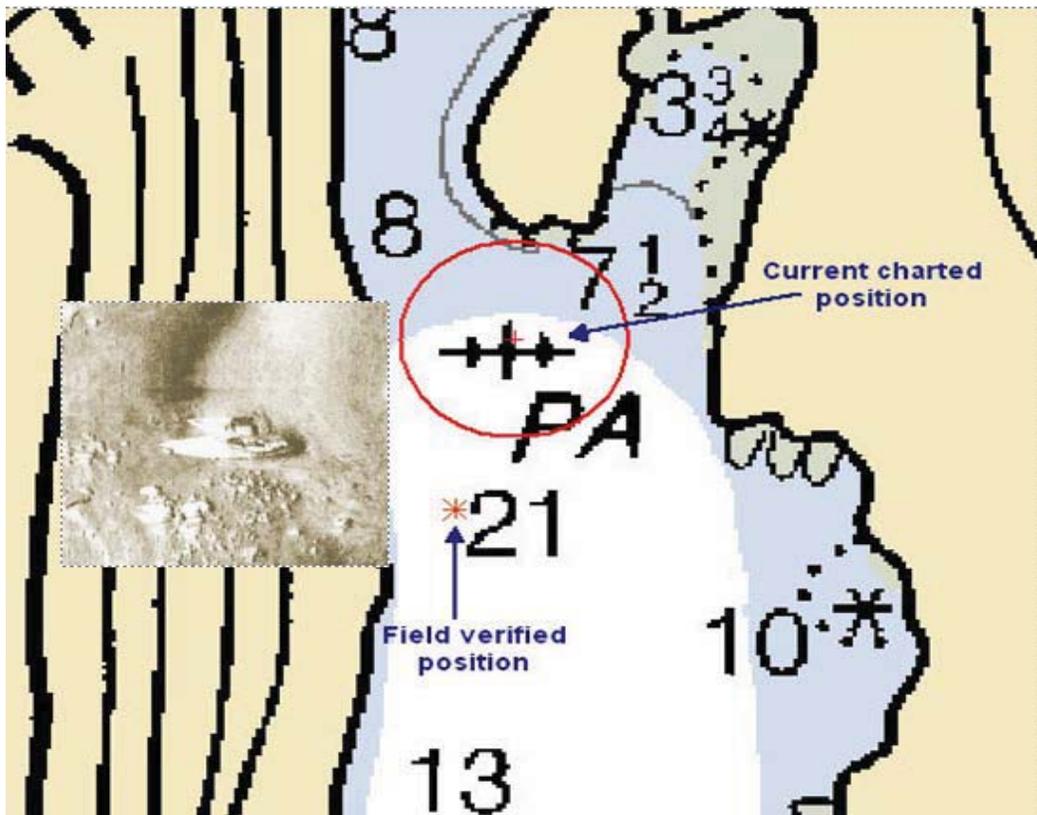


Figure 7: Position and side scan sonar image of AWOIS item for survey H11677

Additional Items

Additional features investigated within the limits of H11677 are described in the Survey Feature Report in Appendix II.¹⁵

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.b. Shoreline Verification

Shoreline verification was performed for survey H11677.

Shoreline Source

The Pacific Hydrographic Branch provided RAINIER with ENC’s US5AK3GM and US5AK3SM for shoreline reference and verification purposes. Both electronic charts have been adequately updated according to photogrammetric survey project GC-10517 (NAD 83).

Shoreline Verification

Limited shoreline verification was conducted near predicted low water in accordance with the Specifications and Deliverables and FPM section 3.4.6. Detached positions (DPs) acquired during shoreline verification were recorded in HYPACK, on DP forms, and were processed in Pydro. These indicate revisions to features and features not found on the verified shoreline. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline. DP forms are included in the *Separates to be Included with Survey Data*.¹⁶

All shoreline data is submitted in Caris Notebook .hob files. The session H11677_Notebook.wrk contains the following:

HOB File	Purpose and Contents
H11677_CompSource.hob	Original Source Data as filtered from ENC cell US5AK3GM
H11677_Reference.hob	Survey outline and limit lines, and AWOIS item positions and radii.
H11677_field_verified_compsource.hob	Field verified source features and shoreline, including edits and updates not requiring DPs.
H11677_Pydro_Updates.hob	New or modified items processed through Pydro.
H11677_Pydro_Disprovals.hob	Deleted items processed through Pydro.
H11677 Deleted Source	Source features requiring removal from original source data

Table 7. List and Description of Notebook HOB files.

Source Shoreline Changes and New Features

Items for survey H11677 that require further discussion and are associated with a detached position, have been flagged “Report” in Pydro in H11677_PSS.pss. Investigation methods

and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix II.

Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement shoreline information compiled on the GC, raster charts, and ENC's as described above.¹⁷

D.2.c. Aids to Navigation

There are no Aids to Navigation within the limits of H11677.¹⁸

D.2.d. Overhead Features

There are no overhead features within the limits of survey H11677.¹⁹

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H11677, and none were detected by the survey.²⁰

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11677, and none were observed to be operating in the area.²¹

D.2.g. Bottom Samples

Ten (10) bottom samples were taken during survey H11677. Approximately half of the samples were taken over or near currently charted bottom types/bottom characteristics. All agreed well with currently charted bottom types/characteristics. The remaining samples were taken in potential anchorages, in less than 100 meters of water. Further information can be found in the Survey Feature Report in Appendix II.²²

D.2.h. Other Findings

There were no additional findings in survey H11677.

As Chief of Party, Field operations for hydrographic survey H11677 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 2007 edition), Field Procedures Manual (March 2007), Standing and Letter Instructions, and all HSD Technical Directives issued through June 2007. 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-O112-RA-07	11/02/07	N/CS34
Coast Pilot Report for OPR-O112-RA-07 (<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/NMCI/MOC-P, ou=NOAA Ship
 RAINIER, email=cc.rainier@noaa.gov
 Reason: I am approving this document for CDR
 Noll
 Date: 2007.12.17 08:34:50 -08'00'

Guy T. Noll
Commander, NOAA
Commanding Officer

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

Survey Sheet Manager:



Amy Sheehan
I am the author of this document
2007.11.12 22:05:05 Z

Amy Sheehan
Survey Technician, NOAA Ship Rainier

Chief Survey Technician:



James B Jacobson
I have reviewed this document
2007.11.16 20:27:49 Z

James B. Jacobson
Chief Survey Technician, NOAA Ship RAINIER

Field Operations Officer:



Charles Yoos
I have reviewed this document
2007.12.10 18:28:52 -08'00'

Charles J. Yoos
Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

- ¹ DAPR filed with Project Reports.
- ² HSRR filed with Project Records.
- ³ Survey junctions with H11678, H11844, H11845 and Lidar surveys H11538 and H11539. Soundings generally agree with junctioning surveys.
- ⁴ Concur.
- ⁵ Concur.
- ⁶ Concur.
- ⁷ HVCR filed with Project Reports.
- ⁸ Tide note appended to this report.
- ⁹ All sounding discrepancies between chart 17326 and H11677 have been reviewed during compilation and are reflected in the HCell as appropriate.
- ¹⁰ Concur.
- ¹¹ Concur. Final tides were applied by field.
- ¹² DTON report appended to this report.
- ¹³ DTONs have been applied, chart updated.
- ¹⁴ Concur.
- ¹⁵ The Survey Feature Report is filed with the hydrographic records. Note: the survey feature report does not include all features from H11677. Additional features were added, some removed, and some modified in CARIS Notebook after the feature report was generated from Pydro. All features included in the compilation of H11677 have come directly from CARIS Notebook, which is the official features deliverable for this survey.
- ¹⁶ Filed with hydrographic records.
- ¹⁷ Concur with clarification. Notebook .HOB files used in compilation of H11677_CS.000. Chart as depicted in H11677_CS.000.
- ¹⁸ Concur.
- ¹⁹ Concur.
- ²⁰ Concur.
- ²¹ Concur.
- ²² 7 of the 10 bottom samples were retained in compilation. Additionally, 22 charted seabed types were retained.

Danger to Navigation Report #1 for H11677

Registry Number:

State:

Locality:

Sub-locality:

Project Number:

Survey Dates: 04/20/2007 - 04/28/2007

Charts Affected

Number	Version	Date	Scale
17326	15th Ed.	06/01/2006	1:40000
17320	17th Ed.	11/01/2005	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	11.25 m	056° 49' 05.165" N	135° 10' 18.237" W	---
1.2	Shoal	5.07 m	056° 49' 46.899" N	135° 11' 57.160" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 198/132 from h11677 / 1016_reson8125_hvf / 2007-118 / 318_1710

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 49' 05.165" N, 135° 10' 18.237" W
Least Depth: 11.25 m
Timestamp: 2007-118.17:11:14.327 (04/28/2007)
Survey Line: h11677 / 1016_reson8125_hvf / 2007-118 / 318_1710
Profile/Beam: 198/132
Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

MBES least depth on high point of submerged outcropping. Sounding has been corrected with predicted tides and preliminary zoning.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11677/1016_reson8125_hvf/2007-118/318_1710	198/132	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding only.

Cartographically-Rounded Depth (Affected Charts):

6fm (17326_1, 17320_1, 16016_1, 530_1)
 6fm 1ft (531_1)
 11.2m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 1:depth known
 STATUS - 1:permanent
 TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Feature Images

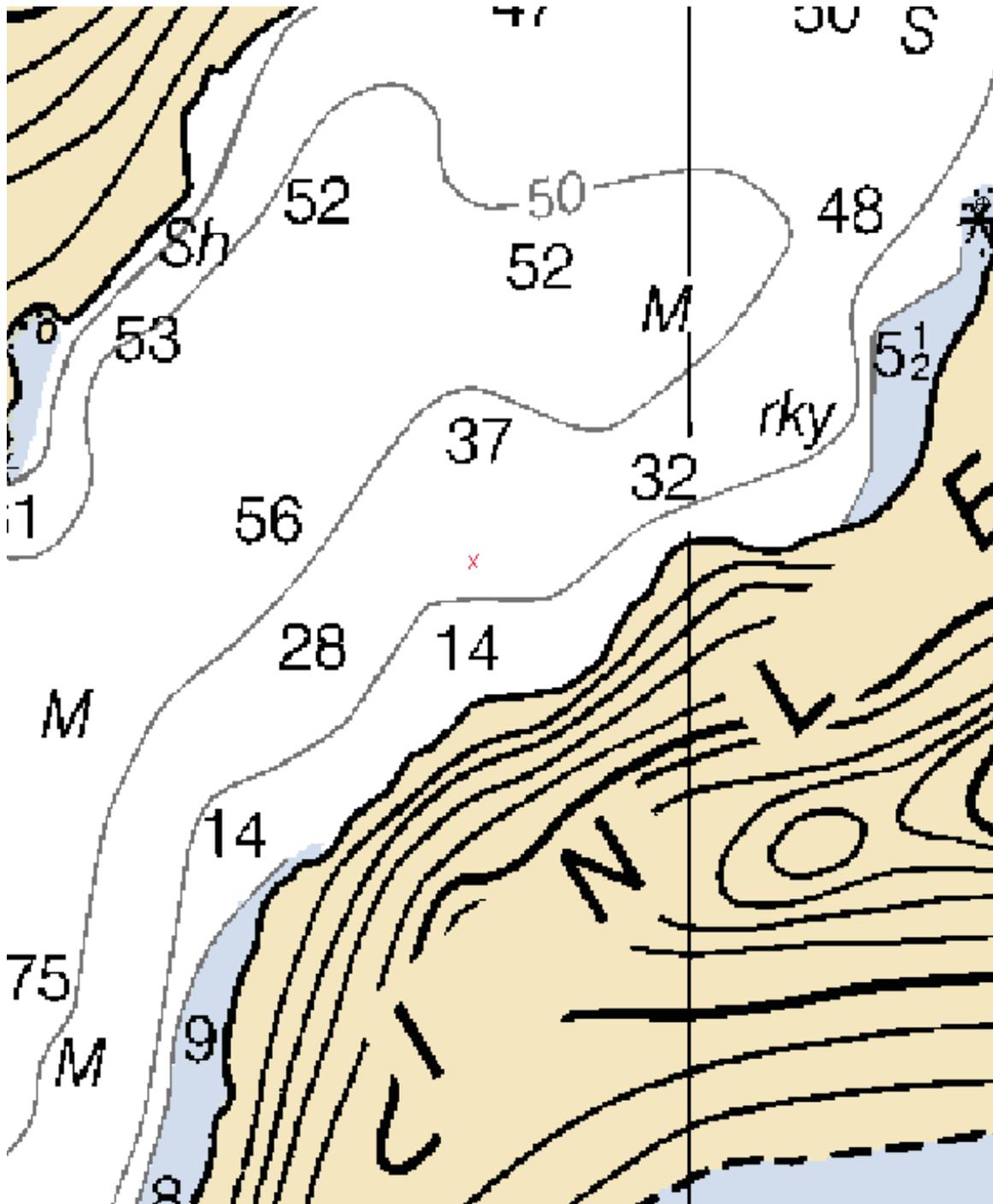


Figure 1.1.1

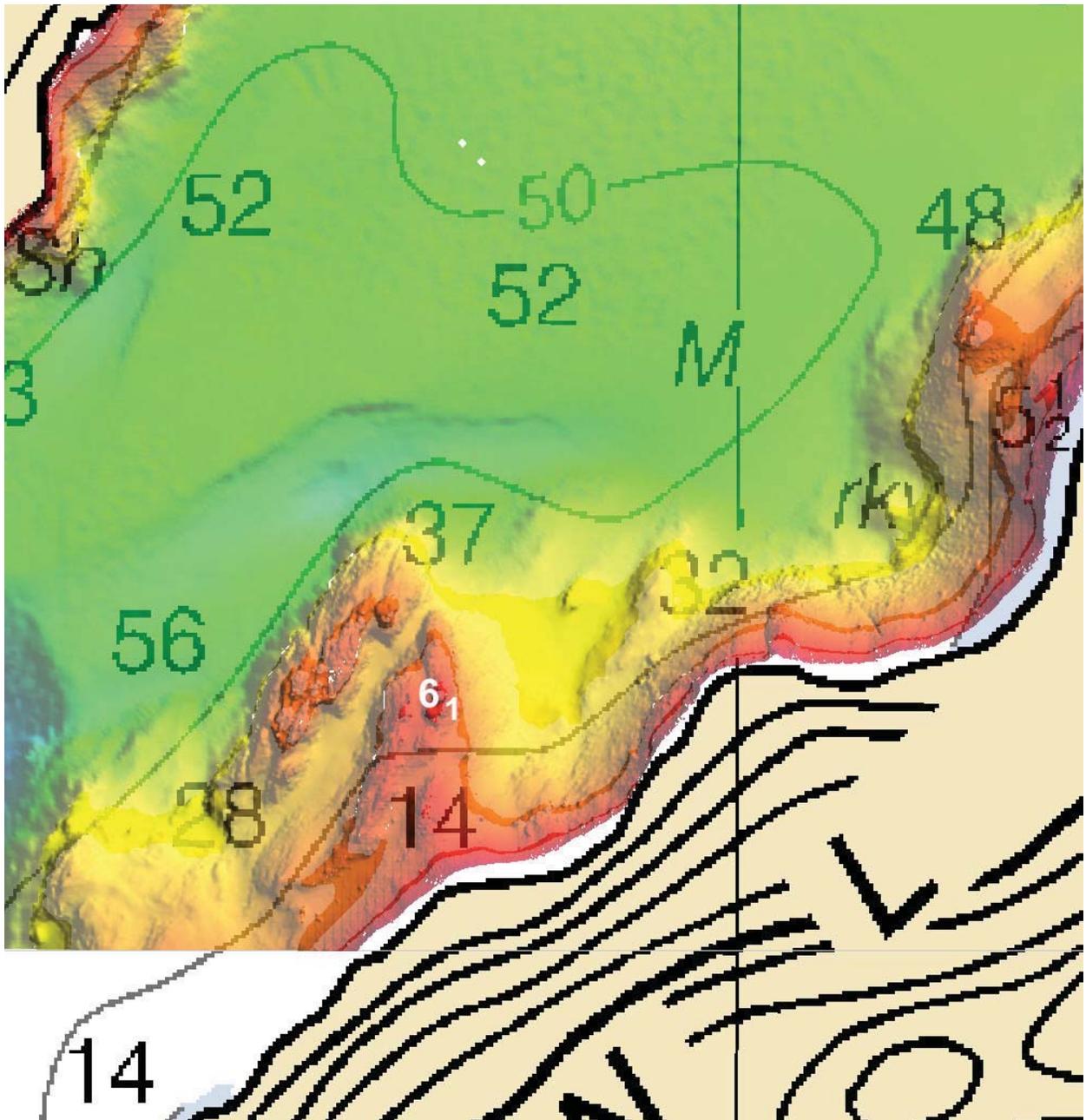


Figure 1.1.2

1.2) Profile/Beam - 181/10 from h11677 / 1021_reson8101_hvf / 2007-110 / 301_1711

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 49' 46.899" N, 135° 11' 57.160" W
Least Depth: 5.07 m
Timestamp: 2007-110.17:12:18.497 (04/20/2007)
Survey Line: h11677 / 1021_reson8101_hvf / 2007-110 / 301_1711
Profile/Beam: 181/10
Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

MBES least depth on high point of submerged outcropping. Sounding has been corrected with predicted tides and preliminary zoning.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11677/1021_reson8101_hvf/2007-110/301_1711	181/10	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding only.

Cartographically-Rounded Depth (Affected Charts):

2 ¾fm (17326_1, 17320_1, 16016_1, 530_1)
 2fm 4ft (531_1)
 5.0m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 1:depth known
 STATUS - 1:permanent
 TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Feature Images

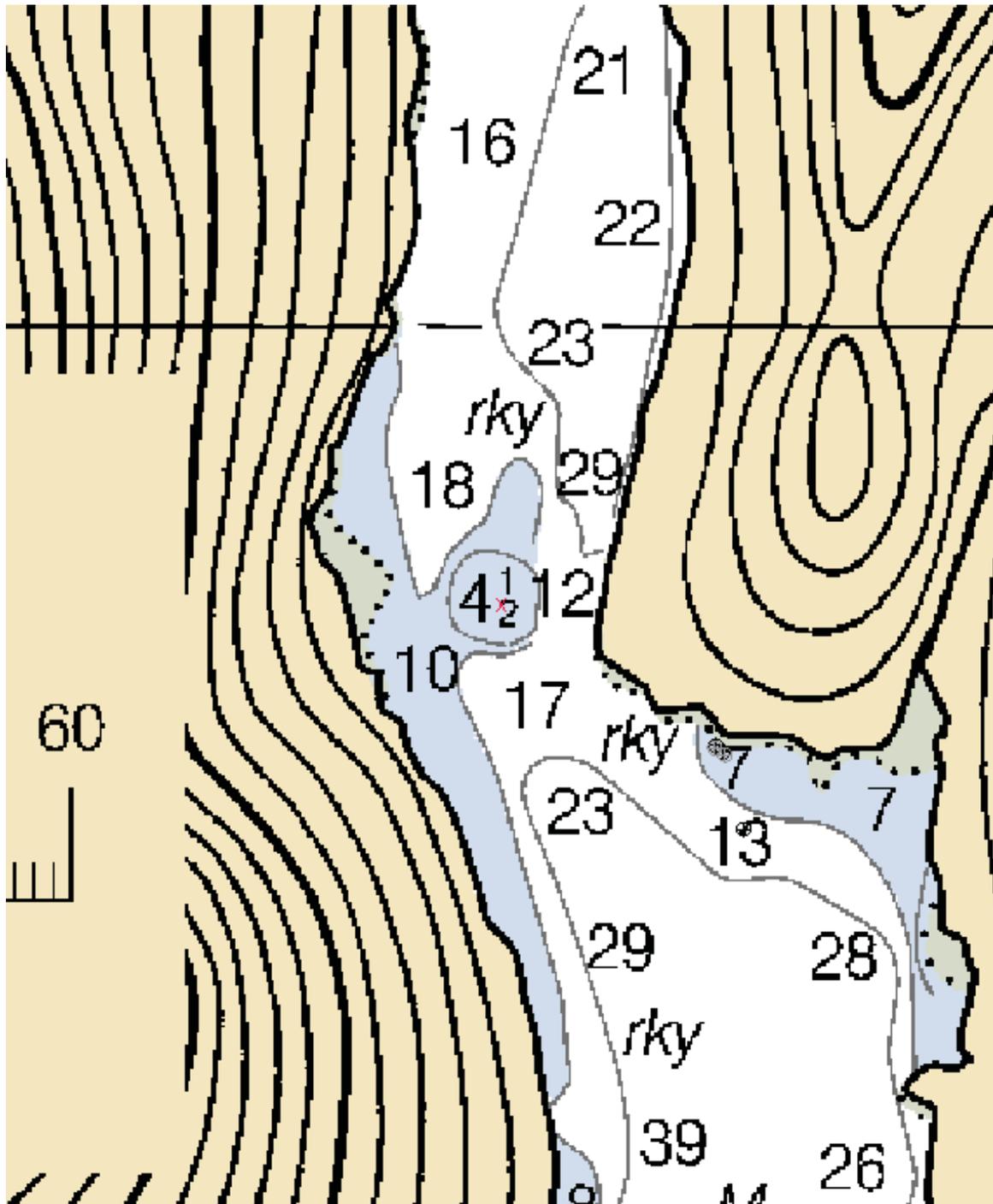


Figure 1.2.1

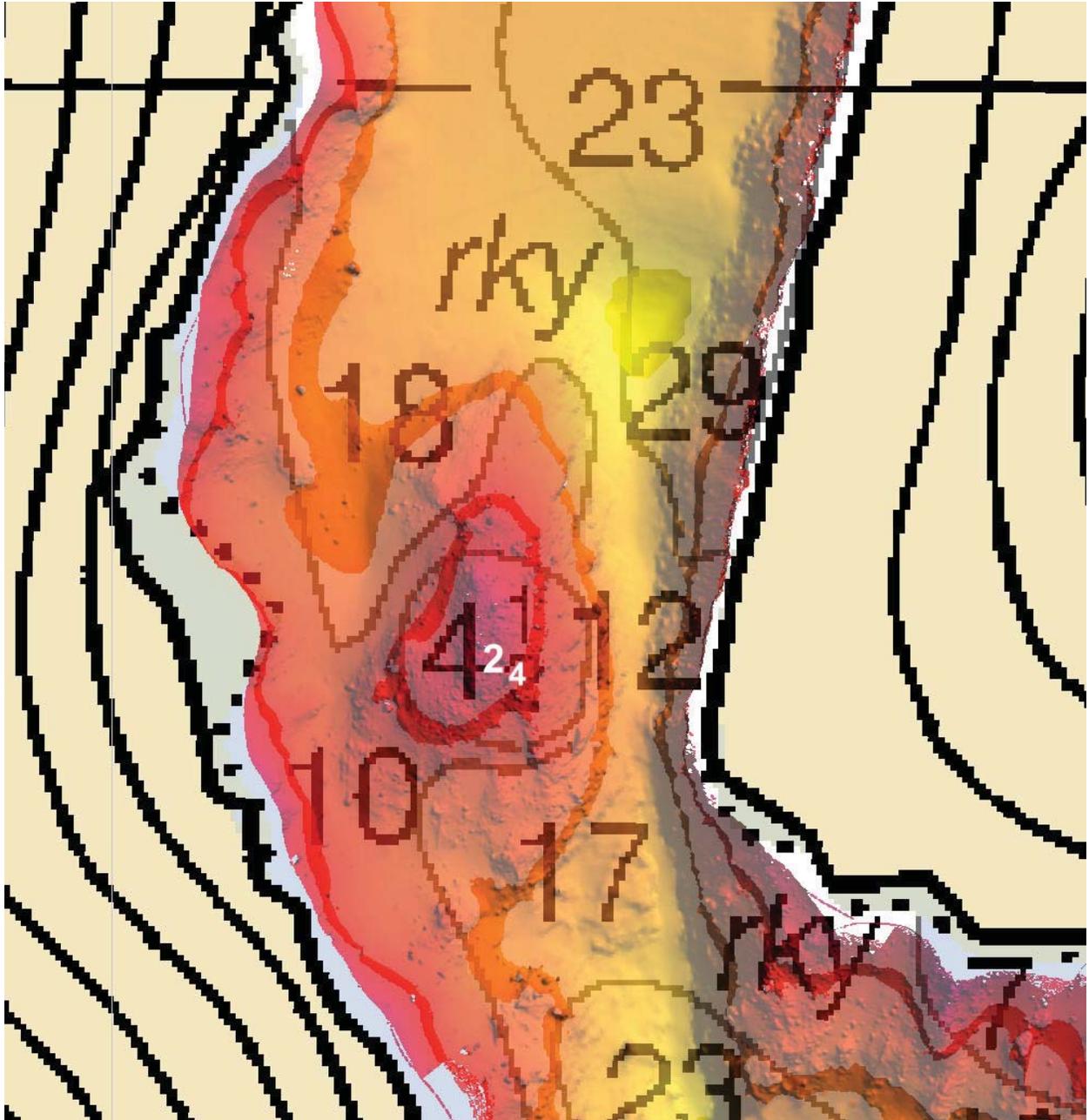


Figure 1.2.2

H11677 AWOIS Report

Registry Number: H11677
State: Alaska
Locality: Approaches to Sitka, AK
Sub-locality: West Crawfish Inlet
Project Number: OPR-O112-RA-07
Survey Dates: 06/01/2007 - 06/17/2007

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17326	16th	11/01/2007	1:40,000 (17326_1)	USCG LNM: 06/12/2007 (09/23/2008) CHS NTM: None (08/29/2008) NGA NTM: 07/11/1998 (10/04/2008)
17320	17th	11/01/2005	1:217,828 (17320_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	GP	[None]	56° 47' 58.5" N	135° 11' 07.2" W	---
2.1	Wreck	38.13 m	56° 47' 53.0" N	135° 11' 09.4" W	53196

1 - Charted Features

1.1) GP No. - 2 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 58.5" N, 135° 11' 07.2" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2007-168.22:40:57 (06/17/2007)
GP Dataset: ChartGPs - Digitized
GP No.: 2
Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Disproved location of CHD(17326) PA wreck with one hundred percent MBES coverage. Item was assigned as AWOIS investigation item for survey H11677. Sunken vessel was found approximately 185m SW of CHD(17326) position. A sounding has been designated at the current location of the vessel.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	2	0.00	000.0	Primary

Hydrographer Recommendations

Hydrographer recommends charting wreck at new position identified with designated sounding in CARIS HIPS/SIPS. Sounding has been designated as Primary and given S-57 attribution and recommendations per findings in survey H11677.

Office Notes

Concur. Chart wreck at surveyed position.

2 - AWOIS Features

2.1) Profile/Beam - 76/165 from h11677 / 1016_reson8125_hvf / 2007-152 / 011_2329

Primary Feature for AWOIS Item #53196

Search Position: 56° 47' 58.6" N, 135° 11' 06.3" W
Historical Depth: [None]
Search Radius: 100
Search Technique: MB, S2
Technique Notes: [None]

History Notes:

LNM 44/76 SEVENTH CGD, 1976: REPORTS THE F/V VINA A 35' WHITE HULL WITH BLACK TRIM, HAS BEEN SUNK IN 125 FEET OF WATER AND IS NOT CONSIDERED A HAZARD TO NAVIGATION. THE VESSEL WAS REPORTED SUNK IN APPROXIMATE POSITION LAT. 56/48 N., LON. 135/11 W. (NAD27) (KRW 02/14/2005)

Survey Summary

Survey Position: 56° 47' 53.0" N, 135° 11' 09.4" W
Least Depth: 38.13 m (= 125.11 ft = 20.852 fm = 20 fm 5.11 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2007-152.23:30:06.337 (06/01/2007)
Survey Line: h11677 / 1016_reson8125_hvf / 2007-152 / 011_2329
Profile/Beam: 76/165
Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Sunken vessel, meets description of AWOIS investigation item assigned for survey H11677. Item was found with one hundred percent MBES data and developed with Side Scan Sonar. Vessel is approximately 35 feet in length, in 125 feet of water.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11677/1016_reson8125_hvf/2007-152/011_2329	76/165	0.00	000.0	Primary
OPR-O112-RA-07_Awois	AWOIS # 53196	181.51	196.4	Secondary (grouped)

Hydrographer Recommendations

Hydrographer recommends updating AWOIS information and charting sunken vessel at this position as, "wreck, least depth known by sounding only."

Cartographically-Rounded Depth (Affected Charts):

21fm (17326_1, 17320_1, 16016_1, 530_1)

21fm (531_1)

38m (500_1, 50_1)

Office Notes

Concur. Recommend updating AWOIS information and charting sunken vessel at this position as, "wreck, least depth known by sounding only."



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 19, 2007

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O112-RA-2007
HYDROGRAPHIC SHEET: H11677

LOCALITY: West Crawfish Inlet, Approaches to Sitka, AK
TIME PERIOD: April 20 - June 2, 2007

TIDE STATION USED: 945-1600 Sitka, AK
Lat. 57° 03.1' N Long. 135° 20.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

TIDE STATION USED: 945-1376 Dorothy Cove, AK
Lat. 56° 43.3' N Long. 135° 4.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.699 meters

REMARKS: RECOMMENDED ZONING

Please use the TCARI grid "O112RA2007-TCARI-F.tc" as the final grid for project OPR-O112-RA-2007, H11677, during the time period between April 20 - June 2, 2007.

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).

Note 2: Due to inaccurate shoreline around Crawfish Inlet and Shamrock Bay, survey tracklines fall outside of the TCARI grid boundaries in some areas. TCARI will extrapolate the tide corrector to cover these soundings.

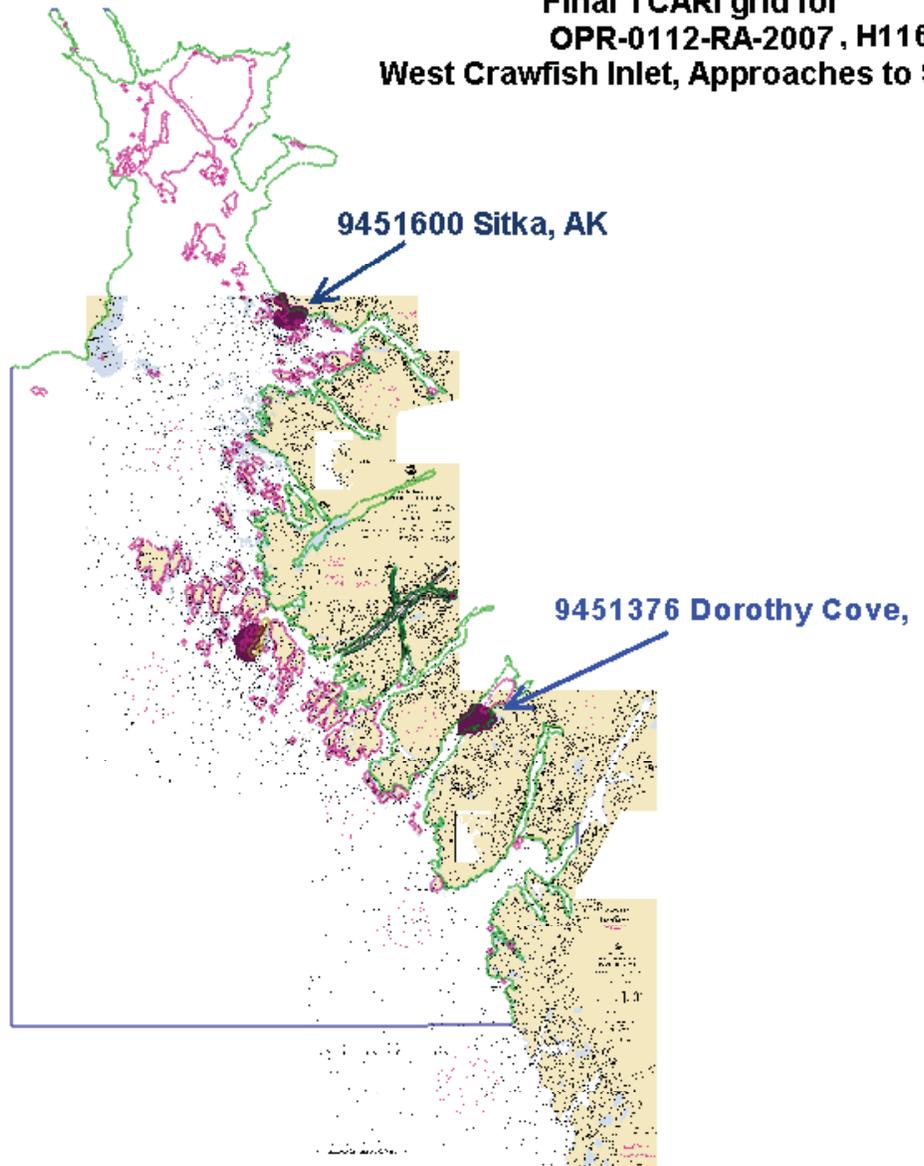
Peter J. Stone

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, c=US, o=CO-OPS,
ou=NOAA/NOS, email=peter.stone@noaa.gov
Date: 2007.09.28 13:06:33 -04'00'

CHIEF, PRODUCTS AND SERVICES DIVISION



**Final TCARI grid for
OPR-0112-RA-2007, H11677
West Crawfish Inlet, Approaches to Sitka, AK**



H11677 HCell Report
Anthony Lukach, ERT Associate
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to provide new survey information in International Hydrographic Organization (IHO) format S-57 to update the largest scale ENC's and RNC's in the region: NOAA RNC 17326 (1:40,000) and corresponding NOAA ENC's US5AK3GM. (See section 4. Meta Areas.)

HCell compilation of survey H11677 utilized Office of Coast Survey DRAFT HCell Specifications Version 4.0. For additional information on the standards and protocols used for HCell Compilation, see the DRAFT A/PHB HCell Reference Guide, version 2.0, 22 February, 2010.

1. Compilation Scale

Depths and features for HCell H11677 were compiled to the largest scale chart in the region, 17326, 1:40,000.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 10-meter Combined Surface, composed of sonar data from survey H11677 and lidar data from survey H11538 in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below. The resultant sounding layer contains 188 ranging from 1.5 to 164.6 meters.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	500	5

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

3. Depth Contours

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

Chart Contour Intervals in Fathoms from Chart 17326	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H11677_SS.000
0	0	0.000	0.000	0
5	9.144	9.3726	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.034	20.250	20
50	91.44	92.812	50.750	50
100	182.88	184.252	100.750	100

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, DEPARE, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

Some modifications made to GC shoreline MLLW contours, to bring the GC shoreline into agreement with H11677 hydrography, necessitated inclusion of several “0” DEPCNT features in the HCell. These 0 value contours have been generalized per the chart above. See 9.2 *Conflicts between Shoreline and Hydrography*.

4. Meta Areas

The following Meta object areas are included in HCell H11677:

M_QUAL

Meta area objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.)

5. Features

5.1 Generalization of Features to Chart Scale

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

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

5.2 Compilation of Features to the HCell

Shoreline features for H11677 were delivered from the field in four different hob files defining new features, modification to GC or charted features, and disprovals. These were deconflicted against GC shoreline, the chart and hydrography during office processing.

During office processing, one rock was digitized from the high resolution BASE Surfaces.

The source of all features included in the H11677 HCell can be determined by the SORIND field.

5.2 Mean High Water Used for HCells

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

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes
DEPCNT	Modified GC MLLW
M_QUAL	Data quality Meta object
OBSTRN	Obstruction area object
SBDARE	Modified GC ledges and reefs, bottom samples, and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features
WEDKLP	New and retained kelp areas
WRECKS	A wreck area

The *_SS HCell contains the following Objects:

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

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

7. Blue Notes

Notes to the RNC and ENC chart compilers are included in the HCell as \$CSYMB features. By agreement with MCD, the NINFOM field is populated with an abbreviated version of the Blue Note (30 characters or less), describing the chart disposition, to be used by MCD in generating their Chart History spreadsheet.

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

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

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

BASE Editor and S-57 Composer Units:

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

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

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

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

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

9. Data Processing Notes

9.1 Junction with H11677

H11677 junctions with surveys H11539, H11844, H11845, and H11678. A common junction was made between the survey H11844 during the compilation. Common junctions were not made with H11845 and H11678, western extent of H11677 should supersede H11845 and the southern extent of H11678 should supersede H11678 in the common area.

10. QA/QC and ENC Validation Checks

H11677 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

H11677_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H11677_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H11677_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11677_outline.gml	Survey outline to populate SURDEX

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.1	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Newport Systems, Inc., Fugawi View ENC 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:

Anthony Lukach
ERT Associate
Pacific Hydrographic Branch
Seattle, WA
206-526-6871
Tony.Lukach@noaa.gov.

APPROVAL SHEET
H11677

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.

A handwritten signature in blue ink, appearing to read 'A. Lukach', with a horizontal line extending to the right towards the text.

Digitally signed
by Anthony
Lukach
Date: 2010.05.03
13:43:56 -07'00'

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 disapproval 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.