

H12085

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No.

Registry No. H12085

LOCALITY

State Alaska

General Locality Kachemak Bay

Sublocality Eldred Passage and Sadie Cove

2009

CHIEF OF PARTY

Captain Donald W. Haines, NOAA

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H12085</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>Kachemak Bay</u></p> <p>Sub-Locality <u>Eldred Passage and Sadie Cove</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>08/12/2009 to 09/04/2009</u></p> <p>Instructions dated <u>7/16/2009</u> Project No. <u>OPR-P357-RA-FA-09</u></p> <p>Vessel <u>RA1 (1101), RA2 (1103), RA3 (2803), RA4 (2801), RA5 (2802), RA6 (2804)</u></p> <p>Chief of party <u>Captain Donald W. Haines, NOAA</u></p> <p>Surveyed by <u>RAINIER Personnel</u></p> <p>Soundings by <u>Reson SeaBat 8125, 8101, 7125 and Knudsen 320M</u></p> <p>SAR by <u>Mary Beth Letrico</u> Compilation by <u>Fernando Ortiz</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Projection 5</u></p> <p><u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS)</u></p> <p><u>nautical charts. Revisions and end notes in red were generated during office processing.</u></p> <p><u>Page numbering may be interrupted or non sequential.</u></p> <p><u>All pertinent records for this survey, including the Descriptive Report, are archived at the</u></p> <p><u>National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.</u></p>	

Descriptive Report to Accompany Hydrographic Survey H12085

Project OPR-P357-RA-FA-09
Southern Portion of Cook Inlet, Alaska
Eldred Passage and Sadie Cove
Scale 1:10,000
August – September 2009
NOAA Ship *Rainier* (s221)
Chief of Party: Captain Donald W. Haines, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-P357-RA-FA-09 dated July 16, 2009 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is Eldred Passage and Sadie Cove, Alaska and corresponds to sheet “B” in the sheet layout provided with the Project Instructions. The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts, in addition to supporting a total regional examination of Kachemak Bay.

Complete multibeam echosounder (MBES) coverage was achieved in the survey area in waters 8 meters and deeper. In depths less than 8 meters additional MBES coverage was acquired to identify least depths over significant features or shoals, as appropriate for this survey. Additional multibeam coverage was achieved in water depths between 8 m and 4 m that meet or exceed the project instruction requirements. In the vicinity of Sadie Cove, additional MBES data were acquired to achieve full coverage to the 2 meter curve,¹ as detailed in the Project Instructions. Exceptions to this are noted in section B.2. Total mileage acquired by each vessel and system is referenced in Table 1.

Data Acquisition Type	Hull Number with Mileage (nm)						Total
	1101	1103	2801	2802	2803	2804	
VBES (main scheme)	-	-	-	-	-	-	-
MBES (main scheme)	35.8	-	75.7	52.7	57.3	54.8	276.3
SSS (main scheme)	-	-	-	-	-	-	-
Crosslines	-	-	3.2	-	12.2	-	15.4
Developments	-	-	-	-	-	-	-
Shoreline	-	23.3	-	-	-	-	23.3
Bottom Samples	-	-	-	-	-	-	-
Total Number of Items Investigated	-	1	-	-	-	-	1
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	9.63

Table 1: Statistics for survey H12085

Limited Shoreline Verification was performed for the survey area seaward of the Navigable Area Limit Line (NALL) for H12085, as per section 3.5.5 of the Field Procedures Manual

¹ NOS Hydrographic Surveys Specifications and Deliverables April 2009, OCS Field Procedures Manual for Hydrographic Surveying April 2009, and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

April 2009. Shoreline features were given S-57 attribution and included for submission in Notebook HOB files.

Data acquisition was conducted from August 12 to September 4, 2009 (DN 224 to 247).

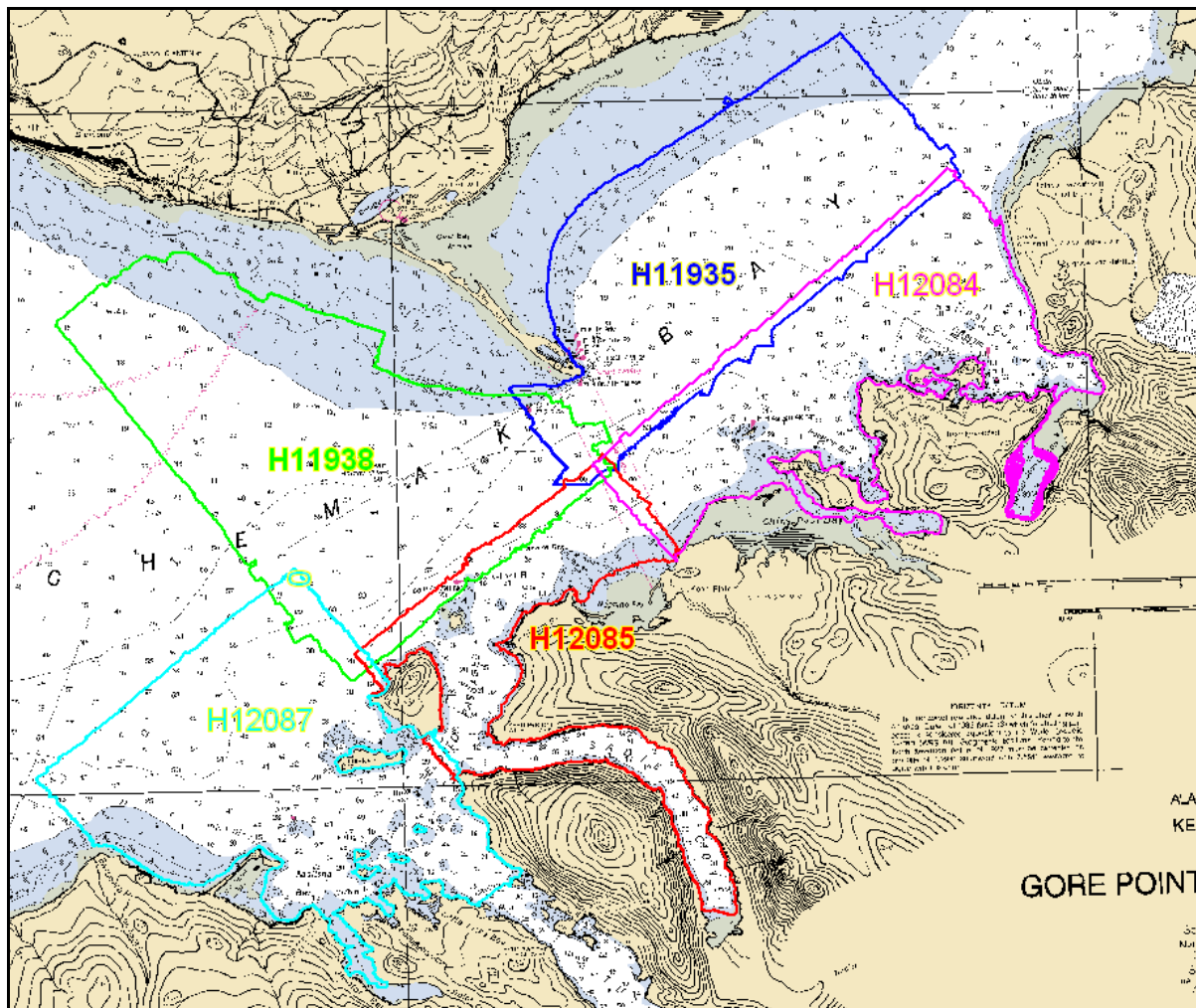


Figure 1: H12085 survey outline and junctions

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-P357-RA-09 Data Acquisition and Processing Report* (DAPR), 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.

B.1. Equipment and Vessels

Data for this survey were acquired by the following vessels:

Hull Number	Name	Length (ft)	Draft (ft)	Acquisition Type
1101	RA-1	29	2	Reson 8125 Multibeam Echosounder
1103	RA-2	29	2	Knudsen 320M Vertical Beam Echosounder Detached Positions
2803	RA-3	29	3.5	Reson 7125 Multibeam Echosounder
2801	RA-4	29	3.5	Reson 7125 Multibeam Echosounder
2802	RA-5	29	3.5	Reson 7125 Multibeam Echosounder
2804	RA-6	29	3.5	Reson 7125 Multibeam Echosounder

Table 2: Data acquisition vessels and systems for H12085

Sound speed profiles were measured in accordance with the Specifications and Deliverables using SEACAT SBE 19 and 19+ profilers, as well as the Brooke Ocean Technology Moving Vessel Profiler.

Multibeam vessel navigation and attitude data were measured and recorded using Applanix POS/MV 320 systems, version 4. Vertical Beam echosounder navigation and attitude data were measured using a Trimble DSM212L GPS receiver and a TSS MAHRS system.

A complete description of survey vessels, hardware, and software systems is included in the *OPR-P357-RA- 09 DAPR*.

No unusual vessel configurations were used for data acquisition.

B.2. Quality Control

B.2.a. Crosslines

Multibeam Echosounder (MBES) crosslines totaled 15.2 nautical miles, comprising 5.57% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the crossline nadir beams in CARIS subset editor and agreed within 0.2 meters at nadir except in areas of steep slope, where they agreed within 0.6 meters.

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 2009 *Rainier* Hydrographic System Readiness Review package submitted with this survey.

B.2.b. Final Uncertainty

Uncertainty values of submitted, finalized grids are calculated in CARIS using the “Greater of the Two” of total propagated uncertainty and standard deviation (scaled to 95%). The Uncertainty of all finalized grids fall below IHO error tolerance as described in the NOS Specifications and Deliverables. IHO error tolerance was assessed creating an IHO “child” layer in CARIS HIPS and the surface data were analyzed in Fledermaus. Figure 2 depicts the

IHO uncertainty layer, with failing nodes in red. Edges of the survey and areas surveyed inshore using 1101 (RA-1) with a tilted 8125 multibeam were the most common instances of failing nodes; refer to *OPR-P357-RA-FA-09 DAPR* for specifics. Figure 3 depicts the surface data analysis, showing that 96.74% of nodes exceed IHO error tolerance requirements.²

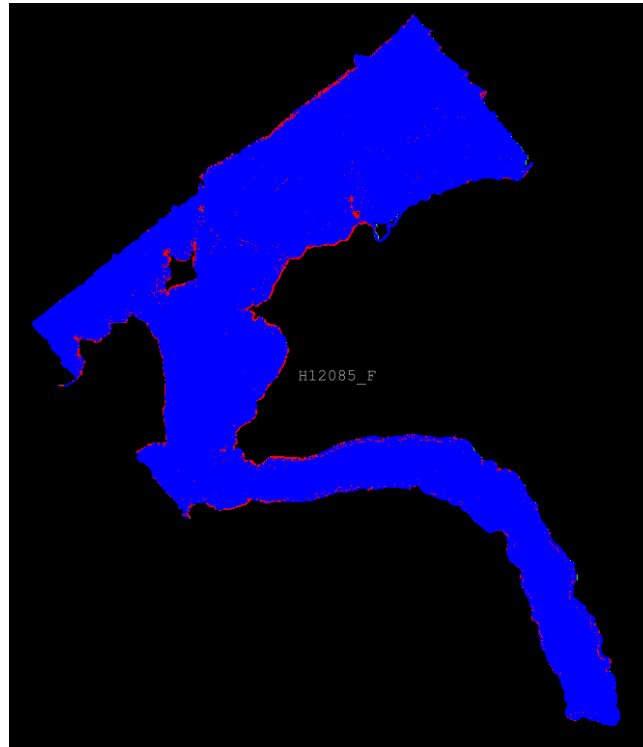


Figure 2: IHO Uncertainty – failing notes depicted in red.

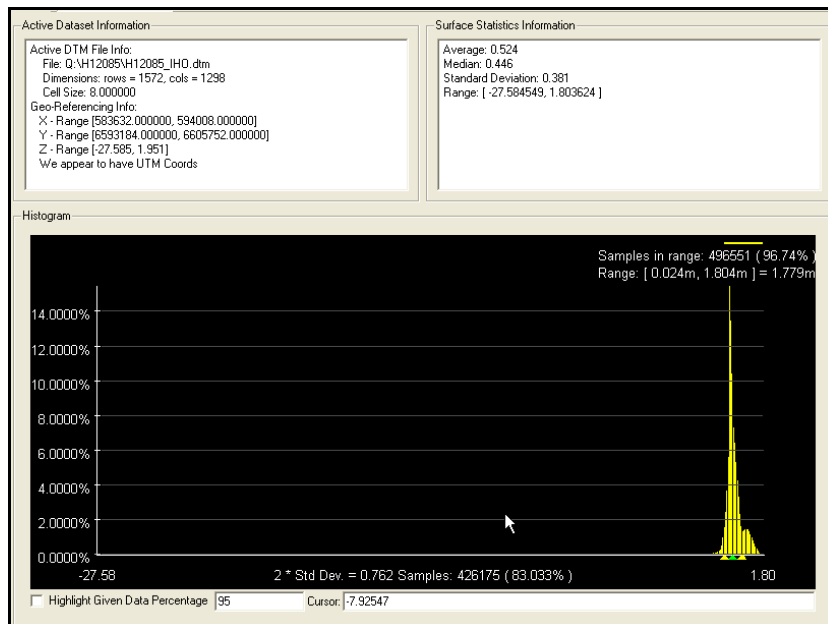


Figure 3: Surface Statistics analysis of IHO error limits.

B.2.c. Junctions

Survey H12085 junctions with surveys H12084 and H12087, which are Sheets A and D of the same project, respectively. Survey H12085 also junctions with surveys H11935 and H11938, completed by NOAA Ship *Fairweather* during project OPR-P357-RA-FA-08.³ The sheet limits and area of overlap can be seen in Figure 1.

Junction Survey	Survey Scale	Date of Survey	Survey Location
H12084	1:7,500	9/8/2009	Northeast
H12087	1:10,000	9/5/2009	Southwest
H11935	1:10,000	9/2/2008	North Northeast
H11938	1:10,000	9/2/2008	Northwest

Table 3: Junction Surveys

Survey H12084 was completed concurrently with survey H12085 during project OPR-P357-RA-FA-09. The area of overlap between the sheets was reviewed visually with contours in Fledermaus for consistency and data were found to be in good general agreement with no discernable offset. Larger differences up to 2.0 meters were evident in areas of steep slope with no discernable trend in differences.

Survey H12087 was completed concurrently with survey H12085 during project OPR-P357-RA-FA-09. The area of overlap between the sheets was reviewed visually with contours in Fledermaus for consistency and data were found to be in good general agreement within 0.2 meters. Larger differences up to 1.5 meters were evident in areas of steep slope, with H12085 generally being deeper than soundings from H12087.

Survey H11935 was completed in 2008 by NOAA Ship *Fairweather* during project OPR-P357-RA-FA-08. A bathymetry attributed grid (BAG) was provided for junction analysis with the project instructions. The area of overlap between the sheets was reviewed visually with contours in Fledermaus for consistency and data were found to be in good general agreement within 0.2 meters. Larger differences up to 1.5 meters were evident at the edges of survey H11935 as a result of apparent noise in the provided BAG. Soundings from H12085 were generally shoaler than the fliers noted in the H11935 BAG.

Survey H11938 was completed in 2008 by NOAA Ship *Fairweather* during project OPR-P357-RA-FA-08. A bathymetry attributed grid (BAG) was provided for junction analysis with the project instructions. The area of overlap between the sheets was reviewed visually with contours in Fledermaus for consistency and data were found to be in good general agreement within 0.1 meters. Larger differences up to 2.0 meters were evident in areas of steep slope near Sixty Foot Rock, which is on the very edge of survey H11938 and appears to be the result of fliers in the surface. Soundings from H12085 were generally deeper than soundings from H11938.⁴

B.2.d. Quality Control Checks

MBES quality control checks were conducted as discussed in the quality control section B of the DAPR.

B.2.e. Data Quality Factors

Positioning Errors

There were noticeable horizontal position offsets seen in Vessel 1101 (RA-1) data in inshore areas. This is most likely due to poor GPS signal quality and multipath error when adjacent to steep cliffs. Line 000_1945 DN226, illustrated in Figure 4, shows the maximum observed 10 meter offset, which exceeds IHO uncertainty specifications. Due to the high density of the data, the accurate depth was evident in the subsets despite the offset. SBET files were created in POSPac from GPS corrector stations in the area in an attempt to mitigate the positioning offsets. Although these correctors improved the horizontal positioning to within IHO specifications for most areas with only minor offsets evident, significant offsets still existed in data collected by vessel 1101 on DN 227 line number 000_1825. When errors exceeded IHO uncertainty specification, data were rejected manually to ensure the BASE surface honored the appropriate depth.⁵ Lines with applied SBETs include vessel 1101 DN 224 line 000_2030, vessel 1101 DN 226 line 000_1945, vessel 1101 DN 227 line 000_1825, and vessel 2803 DN 233 line 000_2301.

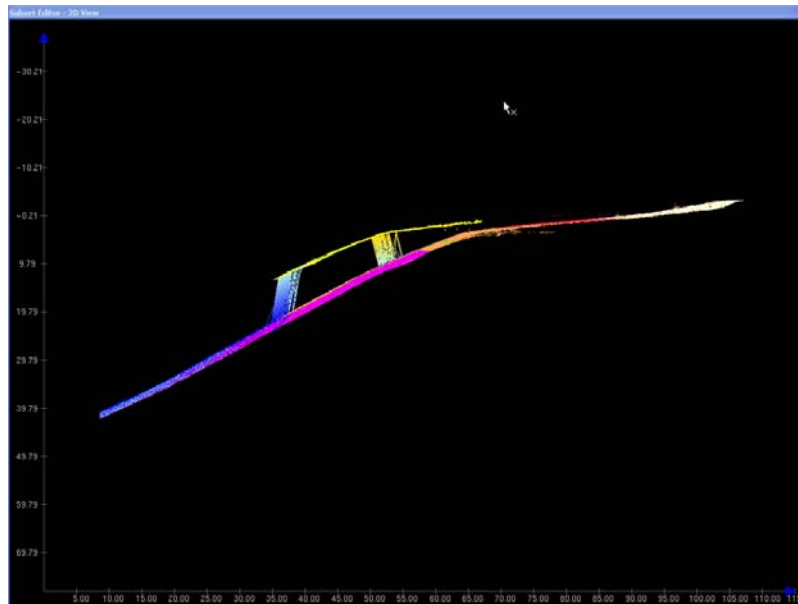


Figure 4: Vessel 1101, Line 000_1945, DN226 Position Offset.

Sound Speed Artifacts

Due to freshwater runoff and the effects of tidal currents a sharp demarcation of water masses was often observed in the field. This proved to be problematic in the acquisition and application of sound velocity correctors. Despite the best efforts of the Hydrographer to conduct sufficient sound velocity casts distributed both spatially and temporally, sound velocity errors were still noticeable in several regions. After correction for sound velocity in

CARIS, some lines still exhibited the characteristic "smiles" and "frowns" indicative of inaccurate sound velocity corrections. To compensate, the Hydrographer, where possible, rejected soundings obviously in error on the outer beams.⁶ An example of sound velocity errors seen in the data is depicted in figure 5.

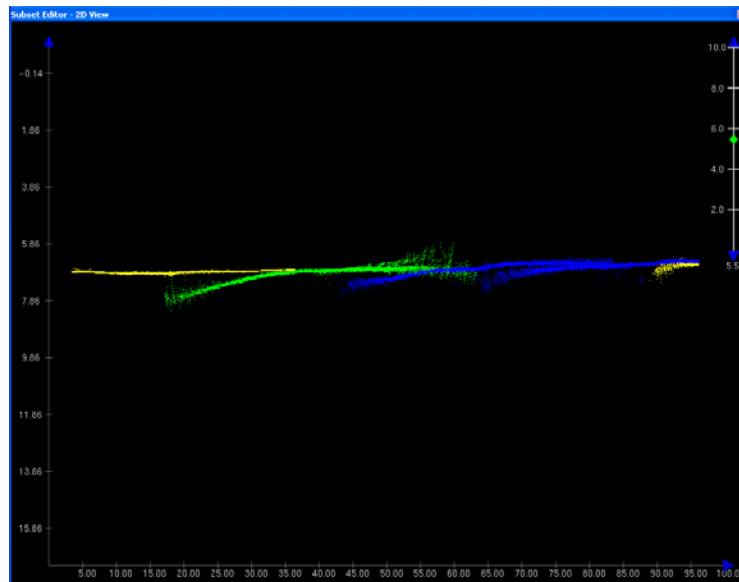


Figure 5: Sound velocity artifacts in Neptune Bay at approximately 59°33'28"N 151°23'00"W.

B.2.f. Object Detection and Coverage Assessment

Acoustic Shadowing

Some coverage holidays were present in the final BASE surface of H12085 due to the irregular seafloor in steeply sloping feature rich areas, creating acoustic shadowing and the lack of returns from away-sloping features. An example of this is depicted in figures 6 and 7. Examination of subsets and multibeam backscatter by the Hydrographer indicates that least depths on all of these features were ensonified.

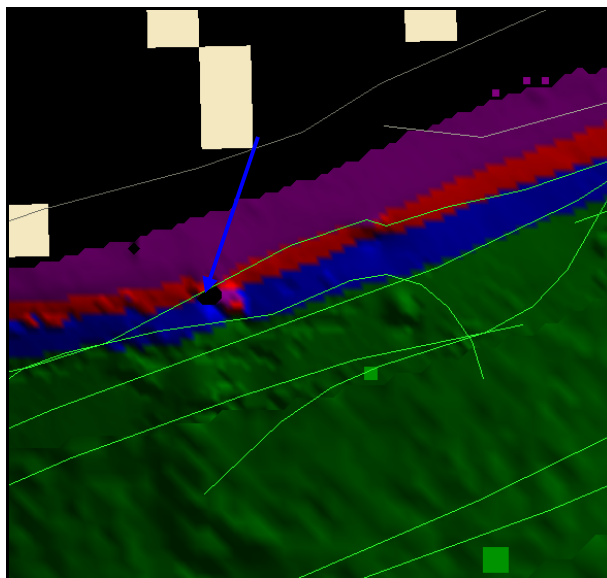


Figure 6: Holiday in North Sadie Cove at 59°30'39.05"N 151°25'57.21"W, caused by acoustic shadow of feature.

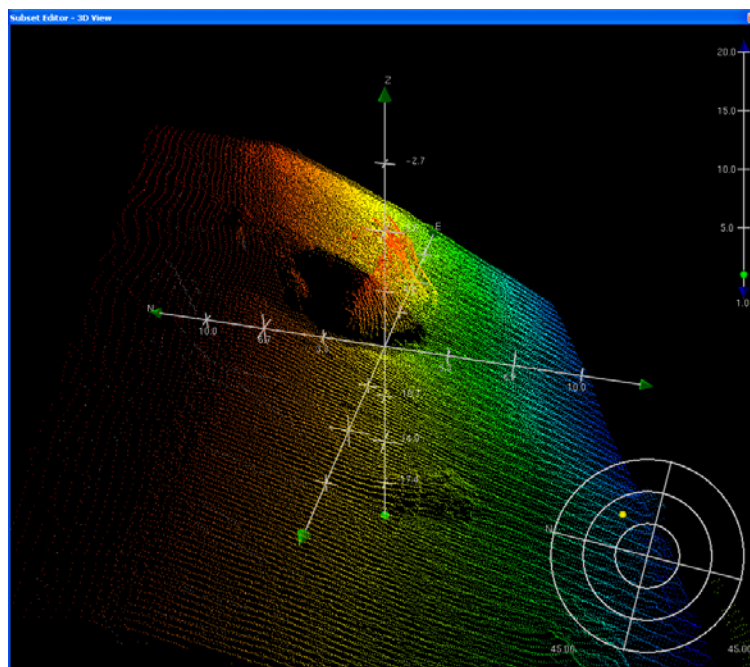


Figure 7: 3D subset view of holiday in North Sadie Cove at 59°30'39.05"N 151°25'57.21"W (ref. fig 11).

Failure to Acquire Complete Coverage to the 2-meter Curve

Due to lower water levels on some days of acquisition in Sadie Cove, complete coverage, as specified in the Project Instructions was not attained to define the entire 2 meter curve. There were four instances of gaps in coverage in Sadie Cove, as depicted in figures 8-11.⁷

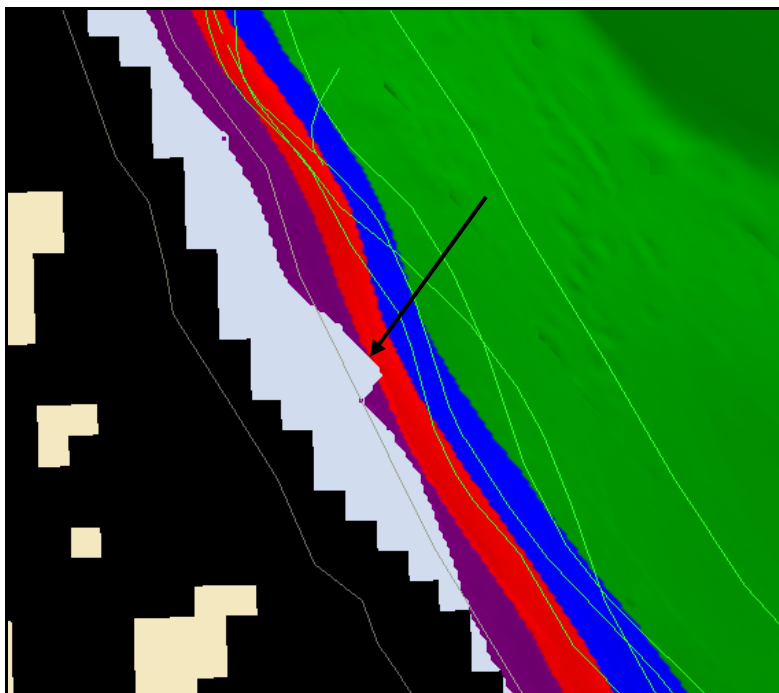


Figure 8: South Sadie Cove at 59°28'35.28"N 151°21'29.90"W. 8 meter horizontal gap in 2m curve indicated by arrow. 2 meter curve indicated between the red and purple depth ranges.

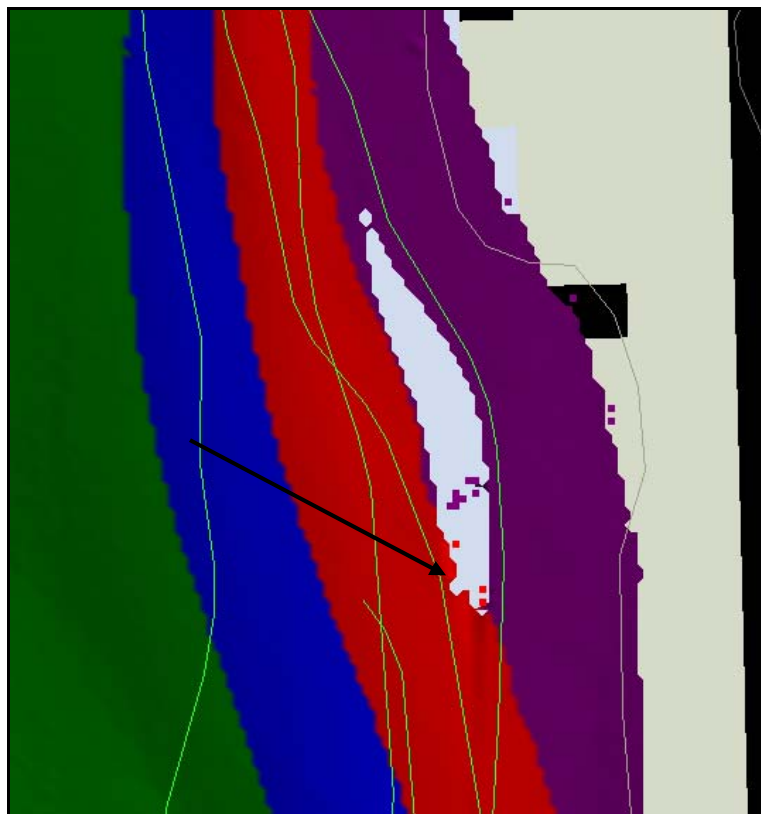


Figure 9: South Sadie Cove at approximately 59°28'16"N 151°20'32"W, 18 meter horizontal gap in 2m curve indicated by arrow. 2 meter curve indicated between the red and purple depth ranges.

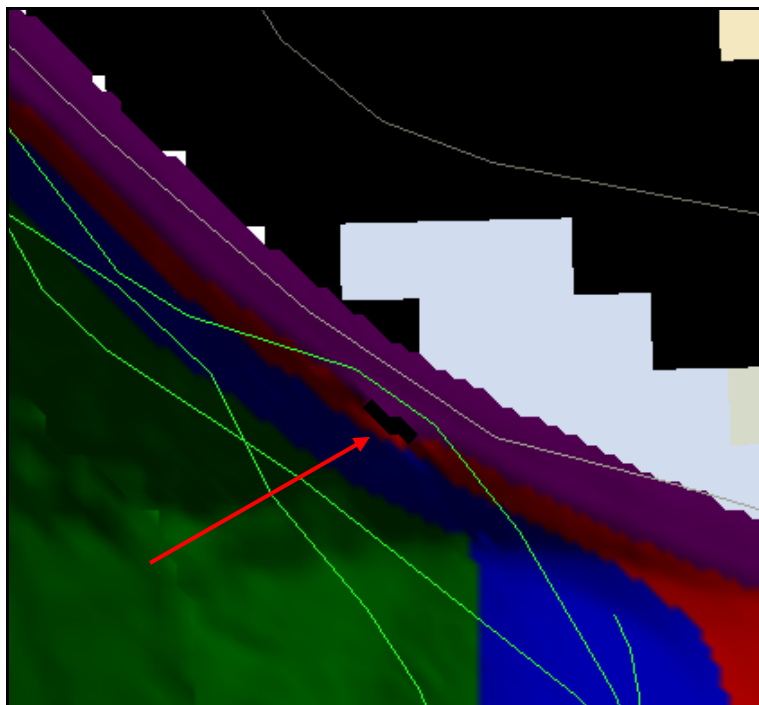


Figure 10: South Sadie Cove at 59°29'34.47"N 151°21'18.51"W. 6 meter horizontal gap in 2m curve indicated by arrow. 2 meter curve indicated between the red and purple depth ranges.

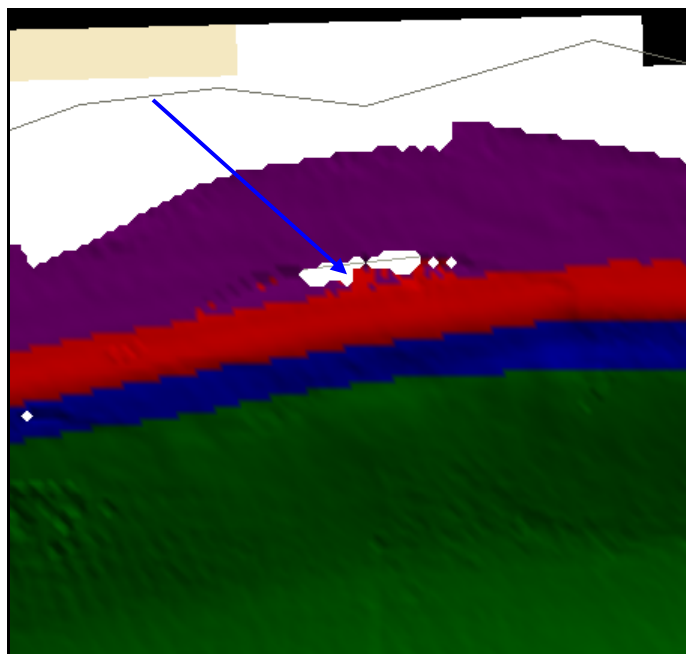


Figure 11: North Sadie Cove at 59°30'48.91N 151°24'14.68"W. A 10 meter horizontal gap in 2m curve is indicated by the arrow. 2 meter curve indicated between the red and purple depth ranges.

Density of Soundings

Data density for survey H12085 met the 5 sounding per node density requirement with 98.28% of nodes having greater than 5 contributing soundings in accordance with the Specifications and Deliverables section 5.1.2.1. The analysis was performed using an ASCII file derived from the final combined surface for H12085. A Python script written by

Fairweather's Weston Renoud was run on this ASCII file, which tallied the total nodes and nodes with at least five soundings contributing and calculated the overall percentage of passing nodes.

B.2.g. Unusual Conditions

No unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data.

B.3. Corrections to Echo soundings

Data reduction procedures for survey H12085 conform to those detailed in the *OPR-P357-RA-FA-09 DAPR*.

B.4. Data Processing

Data processing procedures for survey H12085 conform to those detailed in the DAPR. Data were processed using CARIS HIPS & SIPS v6.2, Service Pack 2, and Hotfix 8. Additional processing details regarding Total Propagated Uncertainty (TPU/TPE) and CUBE Surfaces and Parameters utilized, along with any the deviations from the processing procedures outlined in the DAPR are discussed below.

TPU VALUES:

The survey specific parameters used to compute TPU in CARIS for H12085 are listed in Table 4.

Tide values:	Measured	0.01 m	Zoning	0.07 m
Sound Speed Values:	Measured	0.50 m/s	Surface	As per DAPR

Table 4: Survey Specific CARIS TPU Parameters

Many BASE surfaces were used in processing H12085. Final BASE surface resolutions and depth ranges were set according to Table 5 below. CUBE surfaces were processed with a parameter set corresponding to each resolution as per HTD 2009-2. The CUBE parameter XML file is included with the data deliverables. The submission Field Sheet and BASE surface structure is depicted in figures 12 and 13.

Depth Range (m)	Resolution (m)
0-23	1
20-52	2
46-115	4
103-350	8

Table 5: Depth range and surface resolutions for H12085

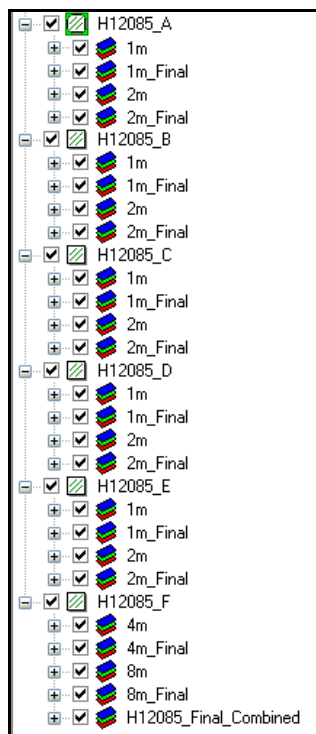


Figure 12: Field sheets and BASE surfaces submitted with H12085.

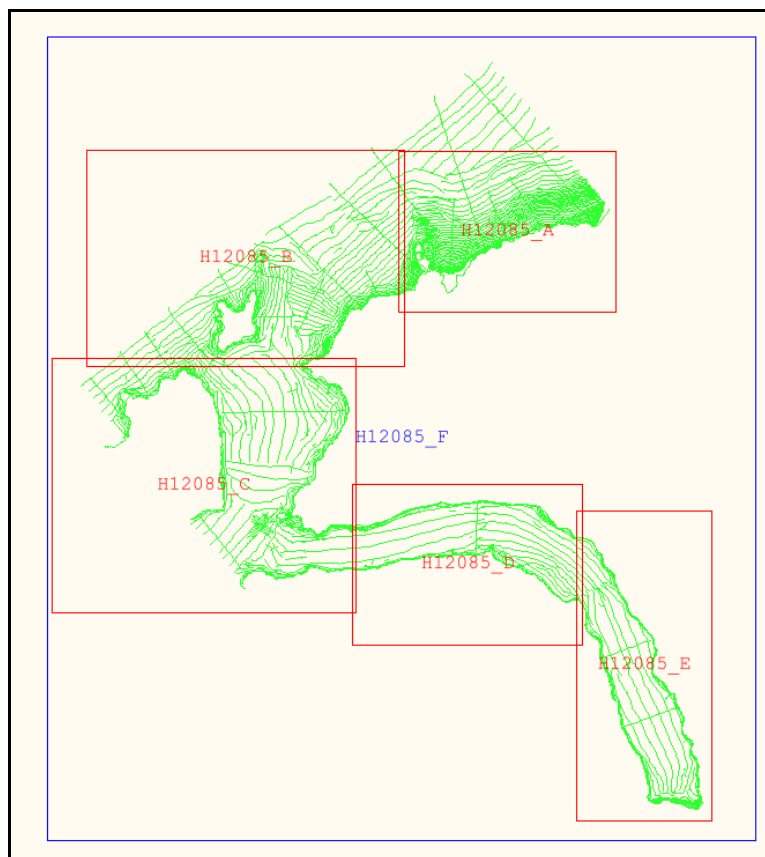


Figure 13: H12085 Field Sheet Layout.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H12085 can be found in the *OPR-P357-RA-FA-09 Horizontal and Vertical Control Report*, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

C.1. 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 6.

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

Table 6: Differential Corrector Sources for H12085.

C.2. Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Seldovia, AK (945-5500) served as control for datum determination and as the primary source for water level reducers for survey H12085.

Rainier personnel installed a Sutron 8210 “bubbler” tide gauge at the following subordinate station in accordance with the Project Instructions. The gauge was installed to provide information to the Center for Operational Oceanographic Products and Services (CO-OPS N/OPS1) for the determination of ellipsoidal height in the area. The station data were not used to determine tidal correctors for the purposes of this hydrographic survey. This station is described in detail in the *OPR-P357-RA-FA-09 Horizontal and Vertical Control Report*.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Bear Cove, AK	945- 5595	30-day	8/11/2009	9/18/2009

Table 7: Tide Stations installed by Ship personnel for H12085

As per the Project Instructions, all data were reduced to MLLW using the final approved water levels from the Seldovia, AK station (945-5500) by applying tide file 9455500.tid and time and height correctors through the zone corrector file P357FARA2009CORP.zdf. **It will not be necessary for the Pacific Hydrographic Branch to apply the final approved water levels to the survey data during final processing.**

The request for Final Approved Water Levels for H12085 was submitted to CO-OPS on September 12, 2009 in accordance with the Field Procedures Manual (FPM), dated April 2009. The Final Tide Note was received on October 9, 2009. This documentation is included in Appendix IV. ⁸

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Chart comparison procedures were followed as outlined in section 4.5 of the FPM and section 8.1.3-D.1 of the HSSDM, utilizing CARIS software program.

Survey H12085 was compared with the following charts:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16645	1:82,662	18 th Ed, January 2002	02/16/2010
16647	1:100,000	3 rd Ed, May 2001	02/16/2010

Table 8: Charts compared with H12085

During acquisition and subsequent processing it was noted that significant discrepancies existed between chart 16645 (1:82,662 scale) and chart 16647 (1:100,000 scale). In spite of the fact that chart 16645 is larger scale than chart 16647, the shoreline of chart 16647 appears to have been compiled at a higher resolution than that of chart 16645. Shoreline as depicted on chart 16647 appears to be consistent with shoreline features from the most recent prior surveys and observations made during shoreline acquisition for survey H12085, while chart 16645 shows inconsistencies in common areas.⁹

While charted depths were far less dense on chart 16647, significant bathymetric features and least depths appeared to agree with survey soundings from this project and prior survey soundings far better than charted depths on chart 16645. For this reason, chart comparison was conducted with chart 16647 in addition to chart 16645.¹⁰

It appears that the most recent prior survey data may not have been applied to chart 16645, but was applied to chart 16647. These discrepancies were noted during acquisition and brought to the attention of Laurie Bennett, a visiting cartographer from the Marine Charting Division (MCD). Additionally, an e-mail was sent to MCD reiterating these issues by the Chief of the Pacific Hydrographic Branch and the Field Operations Officer, *Rainier*. This e-mail correspondence is included in Appendix V.¹¹

The Composite Source File (CSF) supplied with this project was based on the largest scale chart of the area and corresponds to the inaccurate shoreline depicted on chart 16645. For this reason, prior surveys smooth sheets were registered and displayed in CARIS Notebook or Hypack during survey acquisition. Prior survey features were used as reference during shoreline acquisition and, when appropriate, prior survey features were noted and their positions used to locate features in the final features HOB file.

There were several areas where survey soundings revealed shoal depths missed in previous surveys. This is most likely due to the increased coverage attained with modern multibeam technology. In several isolated areas survey soundings were up to 4 fathoms shoaler than charted depths. In all navigationally significant areas a danger to navigation (DTON) was

detailed in the H12085 Danger to Navigation Report, contained in Appendix I. The general area of charted depths agreed well with discrepancies no greater than one fathom with the following significant exceptions:

1. The 50 fathom contour on the north end of the survey was surveyed further inshore than charted on 16645. On 16645 there is no currently depicted 50 fathom contour at the entrance to Sadie Cove. The 50 fathom contours on 16647 are depicted accurately. The Hydrographer recommends updating all contours as per the digital data.¹²
2. The 10 fathom contour is not accurately depicted on 16645. West of Anisom Point the surveyed 10 fathom contour extends further out from shore than the charted contour. On the east side of Cohen Island, the entrance to Sadie Cove, and several areas within Sadie Cove, the 10 fathom contour is depicted further seaward than survey soundings. The 10 fathom contour on 16647 is depicted accurately, with the exception of areas on the south shore of Sadie Cove, where a 1 fathom shoal extended past the charted contours in the vicinity of the 21 fathom sounding on chart 16645.¹³

The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.¹⁴

D.1.b. Automated Wreck and Obstruction Information System (AWOIS) Items

One (1) AWOIS item was located within the survey limits of H12085. This item was assigned for full investigation. The assigned item is currently depicted as a visible wreck on the chart, as depicted below in figure 14. Upon shoreline investigation scattered remnants of the wreck were visible on shore near the mean high water (MHW) line; however the debris was unidentifiable and navigationally insignificant. The Hydrographer recommends removal of the “Visible Wreck” symbol from the chart.¹⁵ Description and pictures of the AWOIS item investigation are included in the Survey Feature Report in Appendix II.

AWOIS#	Latitude	Longitude	Remark	Recommendation
53705	59° 28' 28.62"	151° 20' 32.13"	Deteriorated remains of wreck	Remove from Chart

Table 9: Assigned AWOIS Item and the Hydrographer's remarks and recommendations

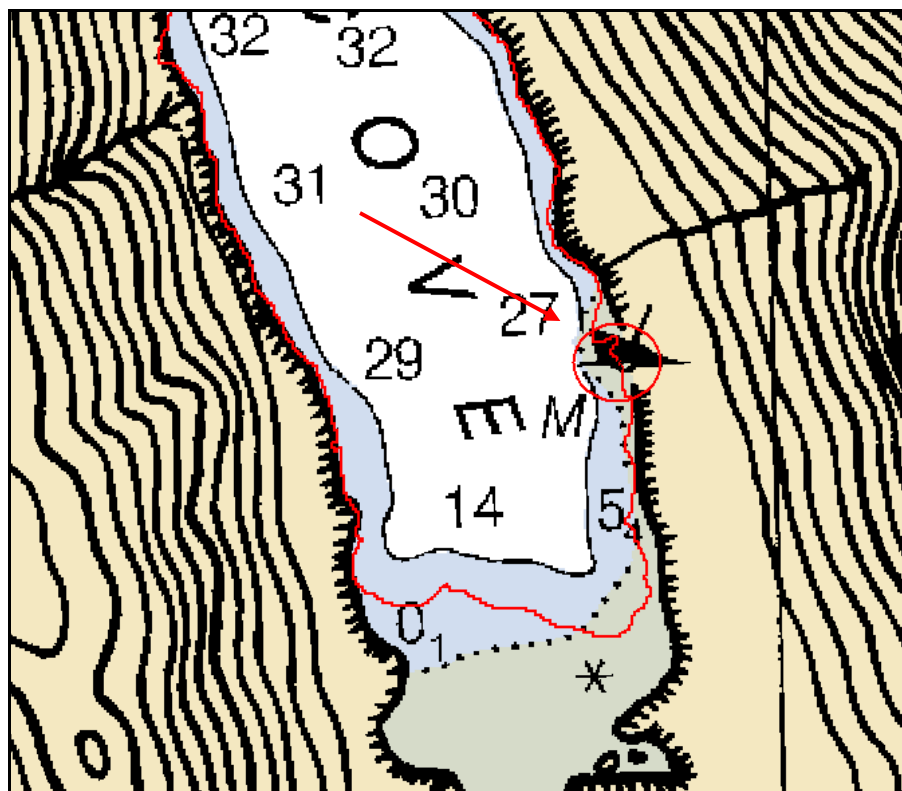


Figure 14: AWOIS item 53705 with survey outline overlaid in red (circle indicated AWOIS Radius)

D.1.c. Other Investigated Features

No additional charted items were investigated and no other features were located on survey H12085.

D.1.d. Dangers to Navigation

Twelve (12) Dangers to Navigation (DTONs)¹⁶ and one (1) Anti-DTON¹⁷ were found on survey H12085, and reported to the Marine Chart Division via email on March 4, 2010. The original DTON submission package is included in Appendix I. Descriptions of each DTON are included in the Survey Feature Report in Appendix II.

D.2. Additional Results

D.2.a. Shoreline Verification

Shoreline Source

Limited shoreline verification was accomplished using the composite source file (CSF) provided with the project instructions. The CSF has been created using the latest ENC's, most recent aerial photogrammetry, and prior hydrographic surveys. Prior survey features within the CSF are for reference. This composite source was printed on paper "boat sheets" and displayed in CARIS Notebook for field verification.

Shoreline Verification

Limited shoreline verification was conducted near predicted low water in accordance with the Specifications and Deliverables section 8.2 and the Field Procedures Manual section 3.5 and 4.4. Detached positions (DPs) acquired during shoreline verification were recorded and S-57 attributed in CARIS Notebook. These indicate revisions to features and features not found in the provided CSF. In addition, annotations describing shoreline were recorded on the hard copy plots of the CSF as described above.

All shoreline data is submitted in CARIS Notebook HOB files. The session H12085_NTBK contains the following:

HOB File	Purpose and Contents
H12085_Composite_Source.hob	Original Source Data as provided for project OPR-P357-RA-09 and filtered to the limits of survey H12085.
H12085_Reference.hob	Survey outline and limit lines and AWOIS item positions and radii.
H12085_Final_Features_File.hob	Composite source data modified by the field to best represent the shoreline at survey scale. This includes the addition of new features and modification of source features. This file retains all features neither verified nor disproved by this survey.
H12085_Disprovals.hob	Composite source items that were deleted or modified in position or geographic type.

Table 10: List and Description of Notebook HOB files

Recommendations

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

D.2.b. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.c. Aids to Navigation

Survey H12085 included one (1) aid to navigation (ATON). The light on Sixty-Foot Rock (Light List number 26190) was visually checked in the field against the digital raster chart and was found to serve its intended purpose.¹⁹

D.2.d. Overhead Features

There is one overhead feature in H12085, a power line over the entrance of Sadie Cove, depicted below in figure 15. The vertical clearance as provided in the composite source file

listed 51.8 meters, which corresponds to the charted 170 foot (51.8 meters) clearance above Mean High Water. The position and height of the feature was visually checked in the field and does not impede navigation in the area, though no direct measurement was conducted.²⁰

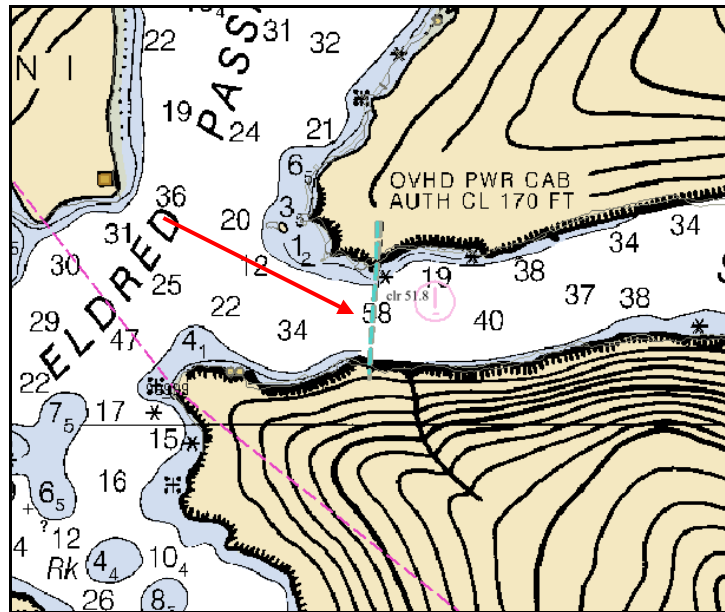


Figure 15: Overhead power cable at the entrance of Sadie Cove

D.2.e. Submarine Cables and Pipelines

There is one charted cable area within the survey limits of H12085, as depicted below in Figure 16. No visible indication of cables was evident in the MBES data in the charted cable area extending northwest from the shore of McKeon Flats. The Hydrographer recommends retaining the cable areas as charted.²¹

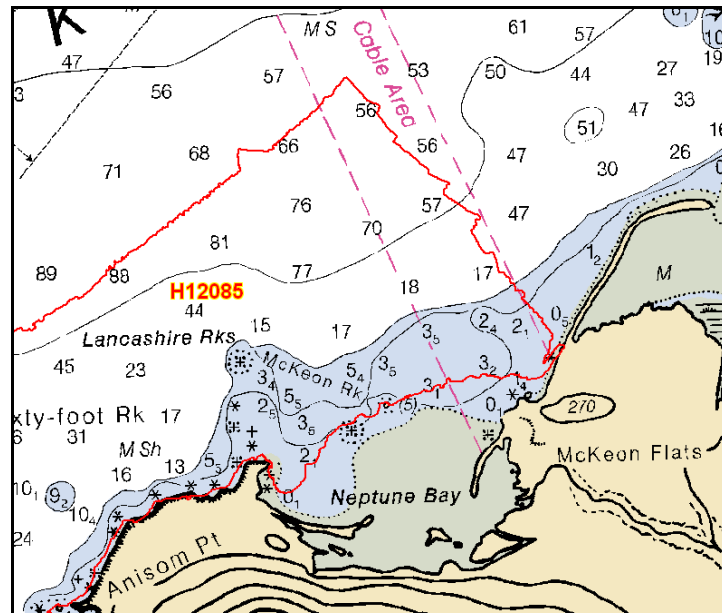


Figure 16: H12085 Cable area

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H12085, and none were observed to be operating in the area.²²

D.2.g. Bottom Samples

Bottom samples were not performed in survey H12085.²³

D.2.h. Other Findings

There are no other findings to report for survey H12085.

E. APPROVAL

As Chief of Party, field operations for hydrographic survey H12085 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 2009 edition), Field Procedures Manual (April 2009 edition), Standing and Project Instructions, and all HSD Technical Directives issued through September 2009. 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>
Hydrographic Systems Readiness Review Package	<i>Under separate cover</i>	N/CS34
Data Acquisition and Processing Report for OPR-P357-RA-FA-09	February 8, 2010	N/CS34
Coast Pilot Report for OPR-P357-RA-FA-09	<i>To be submitted</i>	N/CS26
Horizontal and Vertical Control Report for OPR-P357-RA-FA-09	December 14, 2009	N/CS34
Tides and Water Levels Package for OPR-P357-RA-FA-09	October 21, 2009	N/OPS1

Approved and Forwarded:



Donald W. Haines, CAPT/NOAA
I am approving this document
2010.03.24 08:57:58 -07'00'

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

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

Survey Sheet Manager:



Matthew Nardi
I am the author of this document
2010.03.24 00:59:50 Z

Ensign Matthew J. Nardi, NOAA
Junior Officer, NOAA Ship *Rainier*

Chief Survey Technician:



James B Jacobson
I have reviewed this document
2010.03.23 15:52:09 Z

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

Field Operations Officer:



Brent Pounds
I have reviewed this document
2010.03.23 08:53:12 -07'00'

Lieutenant Brent J. Pounds, NOAA
Field Operations Officer, NOAA Ship *Rainier*

Revisions and Corrections Compiled During Office Processing and Certification

¹ Concur.

² No soundings from red areas were selected for charting. There was nothing navigationally significant in the “red” areas.

³ H12085 junctions with H12084 to the NE, H11935 to the NNE and H11938 to the NW. A common junction was made with an adjoining portion of these surveys. A common junction will be made with H12087 to the SW during compilation process.

⁴ Concur with clarification. Discrepancies are largely due to further processing of the data during SAR process. Similar processing during SAR was performed on H12085 resulting in fewer discrepancies.

⁵ The data is adequate to supersede charted data in the common area despite the POS errors.

⁶ The data is adequate to supersede charted data in the common area despite the SV errors.

⁷ Concur. Data were examined to ensure that significant features were unlikely inside the holidays.

⁸ Tide note is attached to this report.

⁹ Concur.

¹⁰ Concur.

¹¹ E-mail correspondence is included to this report.

¹² Concur.

¹³ Concur. Adjust contour lines based on new survey area.

¹⁴ Concur.

¹⁵ Concur with the hydrographers recommendations to remove the charted AWOIS item #53705. In addition it is recommended to remove the item from the AWOIS database.

¹⁶ Some of the submitted DTONs have a depth value of zero. Since soundings with a value of zero are not charted, the MLLW contour has been adjusted in the HCell to encompass the zero soundings submitted as DTONs. As such the zero value sounding DTONs are not included in the HCell.

¹⁷ A blue note was added to the HCell to remove the item noted in the Anti-DTON report.

¹⁸ Concur with clarification. The submitted hob files were used in the compilation of HCell H12085. During compilation, some modifications were made to accommodate chart scale. Chart features as depicted in the HCell.

¹⁹ Chart ATONs per latest ATONIS information.

²⁰ Chart features as depicted in the HCell.

²¹ Concur. A blue note was added to the HCell to retain cable area.

²² Concur.

²³ Four bottom samples have been imported from the ENC to be retained.

H12085_DTON Report

Registry Number: H12085
State: Alaska
Locality: Southern Portion of Cook Inlet
Sub-locality: Eldred Passage and Sadie Cove
Project Number: OPR-P357-RA-09
Survey Dates: 08/13/2009 - 09/03/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16645	18th	01/12/2002	1:82,662 (16645_1)	NGA NTM: 11/27/2004 (11/29/2008)
16647	3rd	05/12/2001	1:100,000 (16647_1)	[L]NTM: ?
16640	24th	09/15/2001	1:200,000 (16640_1)	[L]NTM: ?
16680	11th	07/01/2008	1:200,000 (16680_1)	[L]NTM: ?
16013	30th	07/01/2006	1:969,761 (16013_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

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

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Shoal	1.76 m	59° 30' 23.2" N	151° 24' 05.5" W
1.2	Shoal	1.86 m	59° 29' 04.5" N	151° 21' 02.6" W
1.3	Shoal	3.44 m	59° 30' 41.7" N	151° 27' 47.2" W
1.4	Shoal	0.06 m	59° 32' 48.8" N	151° 24' 32.3" W
1.5	Shoal	0.01 m	59° 33' 10.7" N	151° 23' 12.8" W
1.6	Shoal	0.02 m	59° 33' 14.8" N	151° 22' 17.2" W
1.7	Shoal	2.00 m	59° 30' 15.9" N	151° 27' 18.1" W
1.8	Shoal	1.42 m	59° 32' 16.8" N	151° 28' 47.2" W
1.9	Shoal	4.72 m	59° 32' 15.0" N	151° 27' 04.8" W

1.10	Shoal	2.44 m	59° 33' 05.4" N	151° 25' 00.4" W
1.11	Shoal	2.88 m	59° 32' 14.4" N	151° 28' 57.3" W
1.12	Shoal	4.27 m	59° 33' 12.4" N	151° 25' 00.1" W
1.13	Shoal	4.41 m	59° 31' 17.0" N	151° 27' 05.1" W

1 - Danger To Navigation

1.1) Profile/Beam - 16447/9 from h12085 / 1101_reson8125 / 2009-226 / 000_1708

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 30' 23.2" N, 151° 24' 05.5" W
Least Depth: 1.76 m (= 5.79 ft = 0.965 fm = 0 fm 5.79 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.182 m
Timestamp: 2009-226.17:29:51.185 (08/14/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-226 / 000_1708
Profile/Beam: 16447/9
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding. Ledge extends out from shore. Chart 16647 has ledge depicted accurately.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)
-1fm 0ft (16647_1, 531_1)
1.8m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090814
SORIND - US, US, NSURF, H12085

Feature Images



Figure 1.1.1

1.2) Profile/Beam - 5455/50 from h12085 / 1101_reson8125 / 2009-226 / 000_1859

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 29' 04.5" N, 151° 21' 02.6" W
Least Depth: 1.86 m (= 6.11 ft = 1.019 fm = 1 fm 0.11 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.182 m
Timestamp: 2009-226.19:05:48.057 (08/14/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-226 / 000_1859
Profile/Beam: 5455/50
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding. Ledge extends out from shore. Chart 16647 has ledge depicted accurately.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

1fm 0ft (16647_1, 531_1)

1.9m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090814
SORIND - US, US, NSURF, H12085

Feature Images

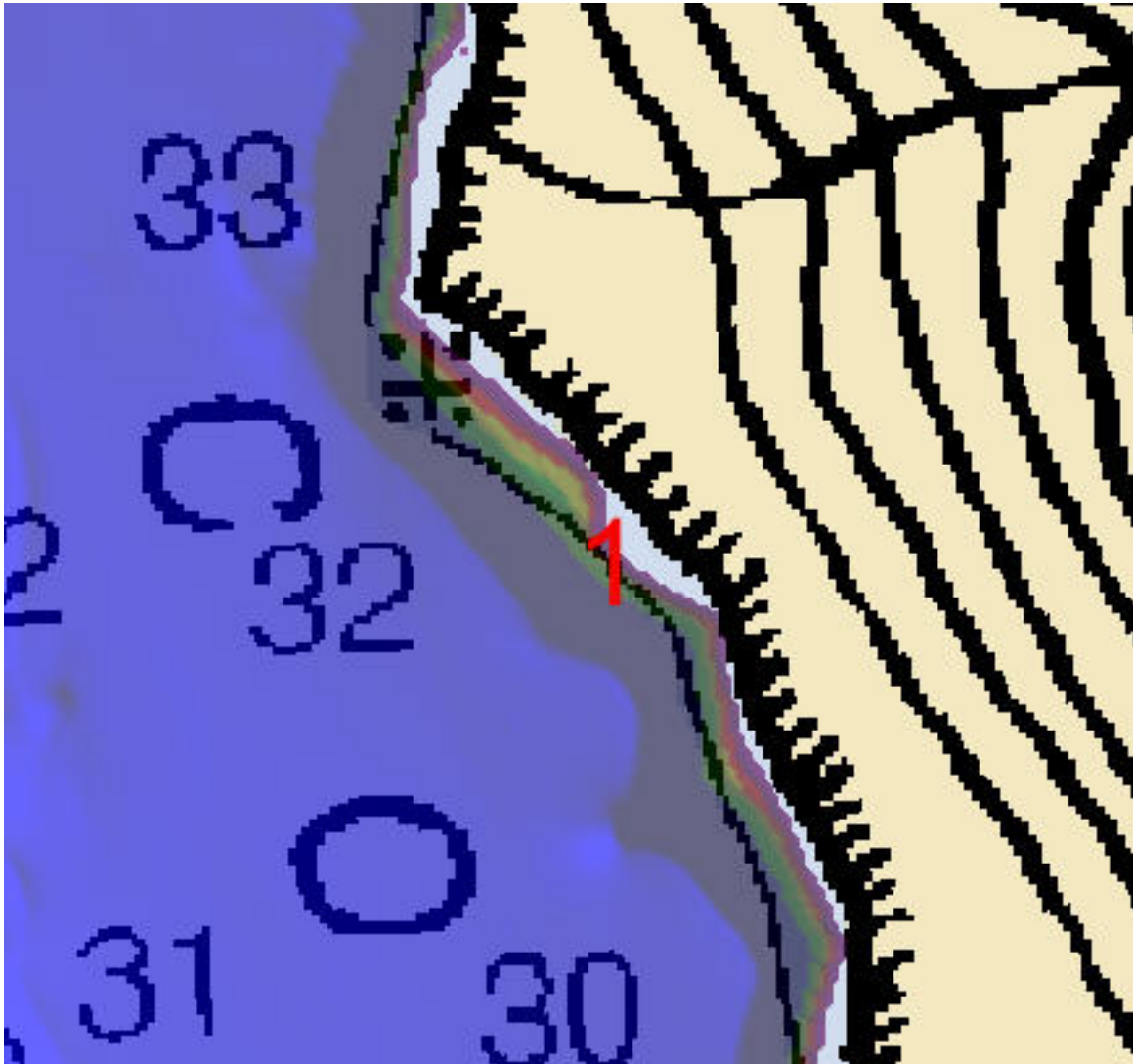


Figure 1.2.1

1.3) Profile/Beam - 1348/66 from h12085 / 1101_reson8125 / 2009-226 / 000_2346

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 30' 41.7" N, 151° 27' 47.2" W
Least Depth: 3.44 m (= 11.29 ft = 1.881 fm = 1 fm 5.29 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.182 m
Timestamp: 2009-226.23:48:14.714 (08/14/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-226 / 000_2346
Profile/Beam: 1348/66
Charts Affected: 16645_1, 16647_1, 16640_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Mischarted Islet. Sounding on seaward extent of shoal.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1 $\frac{3}{4}$ fm (16645_1, 16640_1, 16013_1, 530_1)

1fm 5ft (16647_1, 531_1)

3.4m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090814
SORIND - US, US, NSURF, H12085

Feature Images

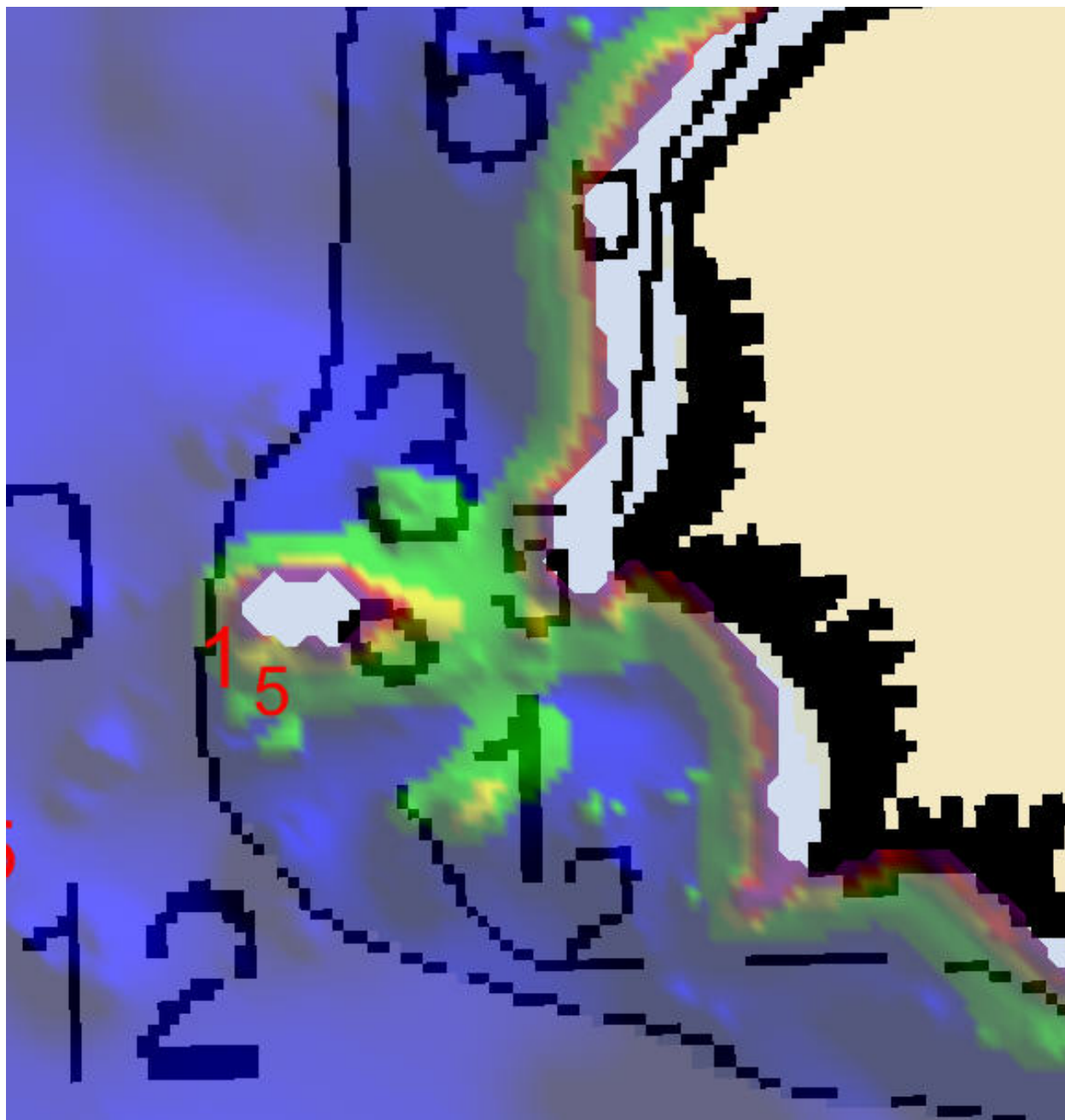


Figure 1.3.1

1.4) Profile/Beam - 2029/225 from h12085 / 1101_reson8125 / 2009-227 / 000_1802

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 32' 48.8" N, 151° 24' 32.3" W
Least Depth: 0.06 m (= 0.20 ft = 0.033 fm = 0 fm 0.20 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.978 m ; TVU (TPEv) ± 0.541 m
Timestamp: 2009-227.18:07:15.855 (08/15/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-227 / 000_1802
Profile/Beam: 2029/225
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

0 contour moved seaward. See attached chartlet for digitized 0 Fathom contour.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

0fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

0fm 0ft (16647_1, 531_1)

.1m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090815
SORIND - US, US, NSURF, H12085

Feature Images

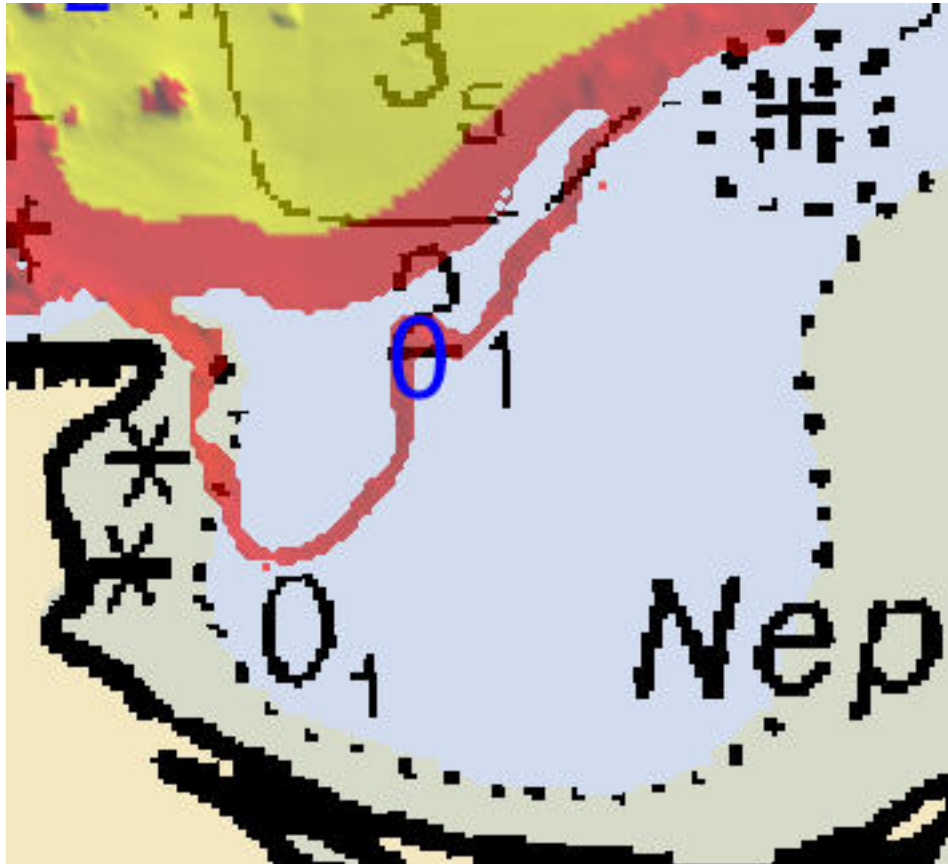
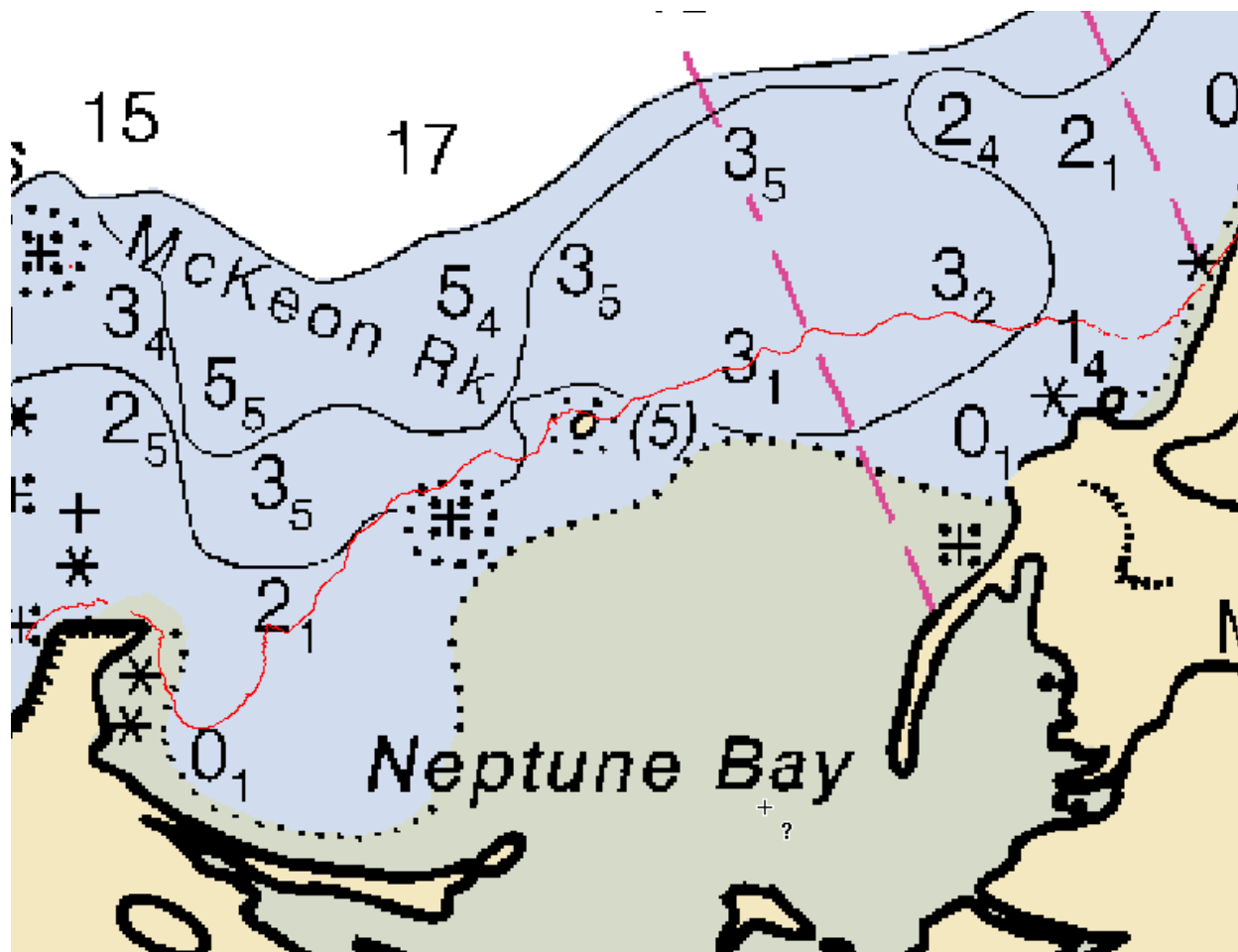


Figure 1.4.1

*Figure 1.4.2*

1.5) Profile/Beam - 2615/209 from h12085 / 1101_reson8125 / 2009-227 / 000_1825

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 33' 10.7" N, 151° 23' 12.8" W
Least Depth: 0.01 m (= 0.03 ft = 0.005 fm = 0 fm 0.03 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.964 m ; TVU (TPEv) ± 0.290 m
Timestamp: 2009-227.18:30:23.185 (08/15/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-227 / 000_1825
Profile/Beam: 2615/209
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

0 contour moved seaward. See attached chartlet for digitized 0 Fathom contour.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

0fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

0fm 0ft (16647_1, 531_1)

.0m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090815
SORIND - US, US, NSURF, H12085

Feature Images

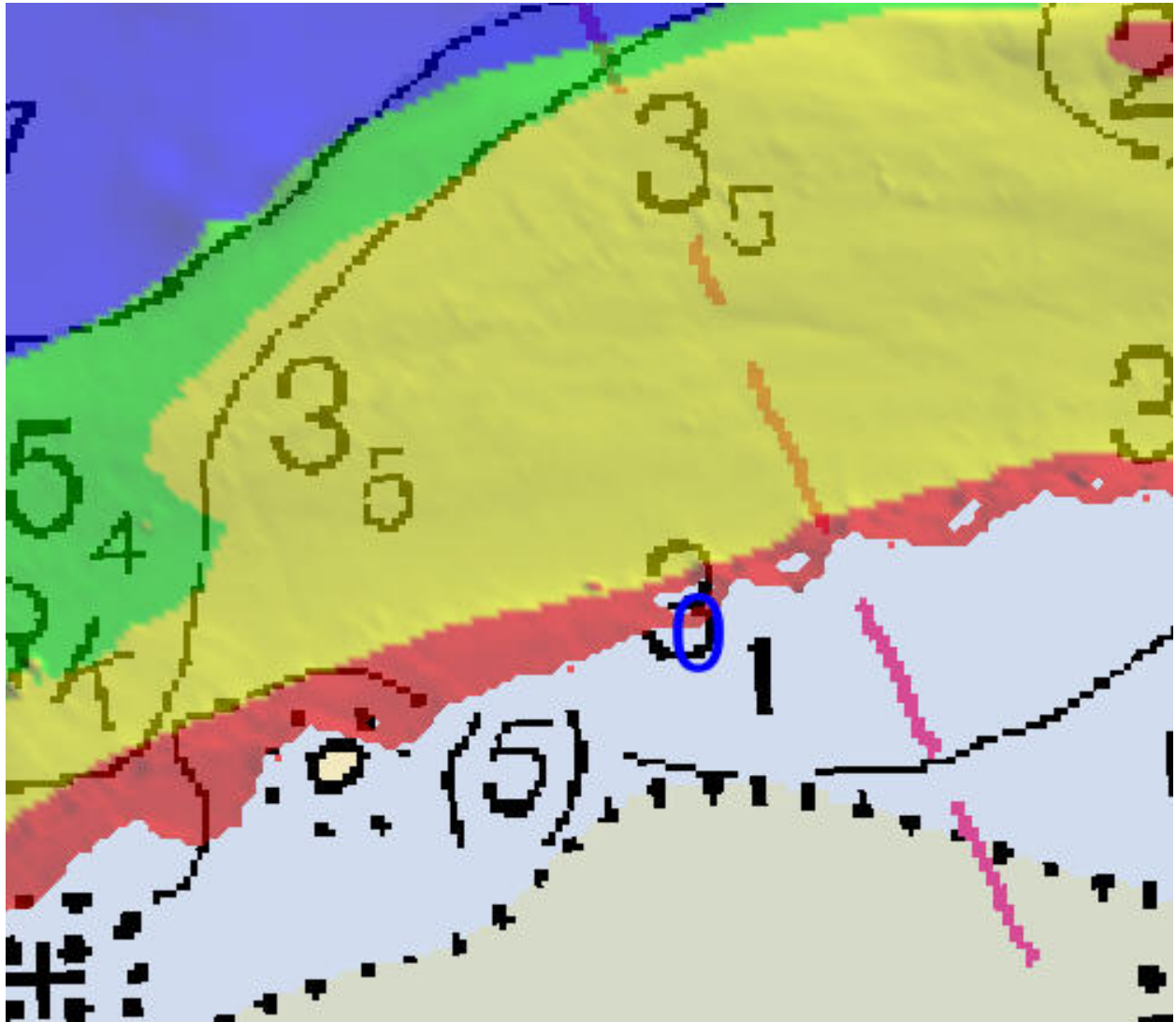
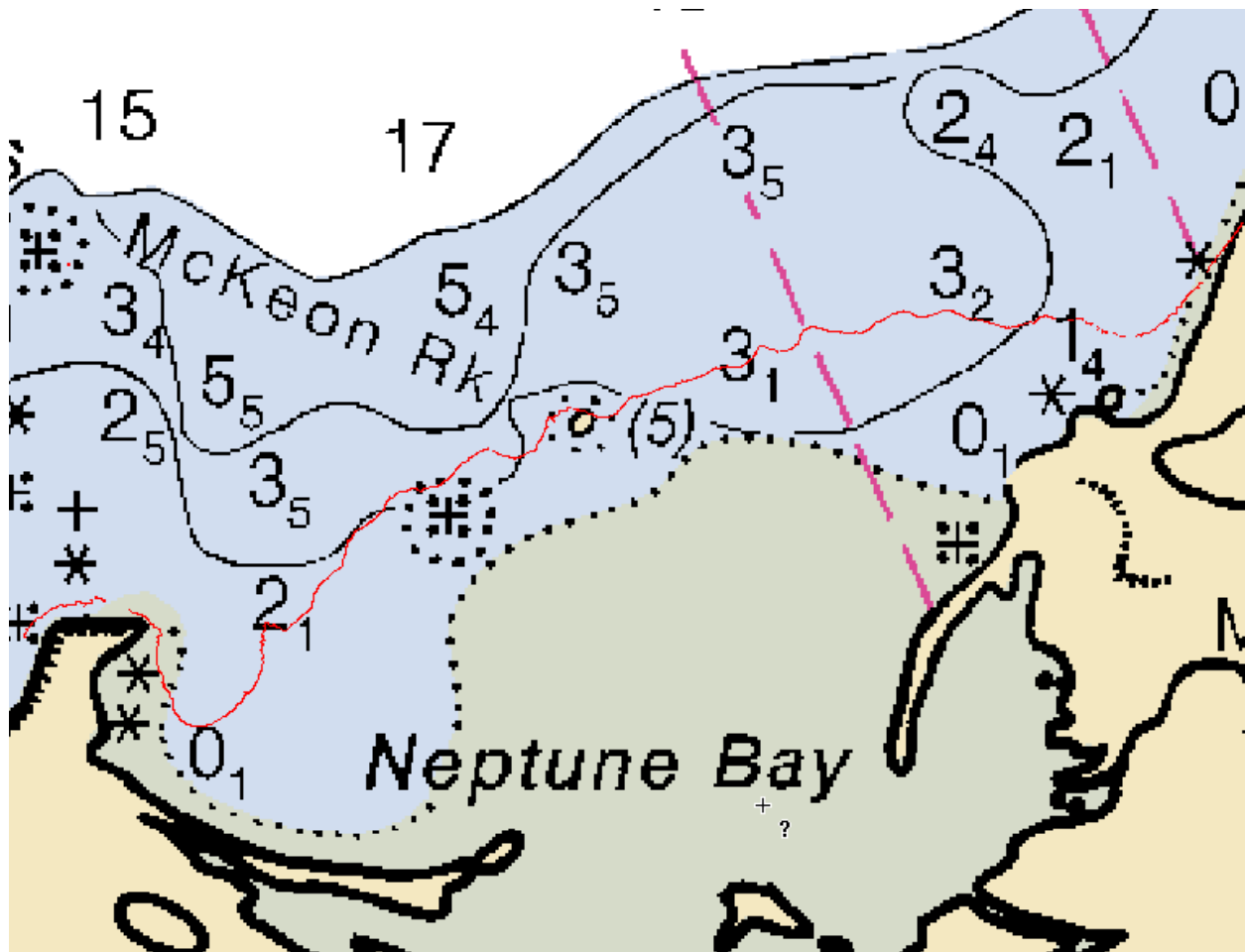


Figure 1.5.1

*Figure 1.5.2*

1.6) Profile/Beam - 5846/223 from h12085 / 1101_reson8125 / 2009-227 / 000_1825

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 33' 14.8" N, 151° 22' 17.2" W
Least Depth: 0.02 m (= 0.08 ft = 0.013 fm = 0 fm 0.08 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.997 m ; TVU (TPEv) ± 0.669 m
Timestamp: 2009-227.18:37:00.054 (08/15/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-227 / 000_1825
Profile/Beam: 5846/223
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

0 contour moved seaward. See attached chartlet for digitized 0 Fathom contour.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

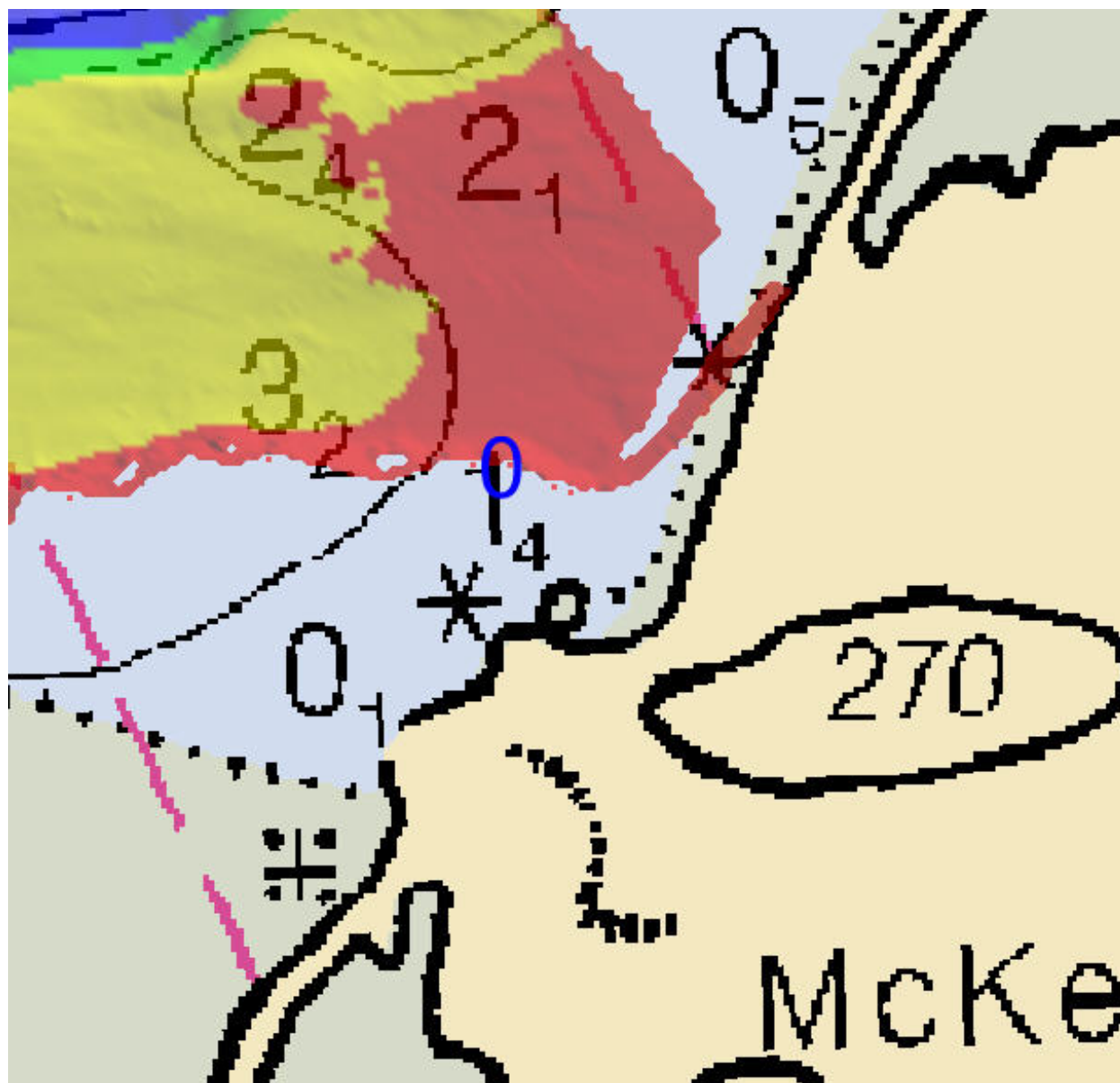
0fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

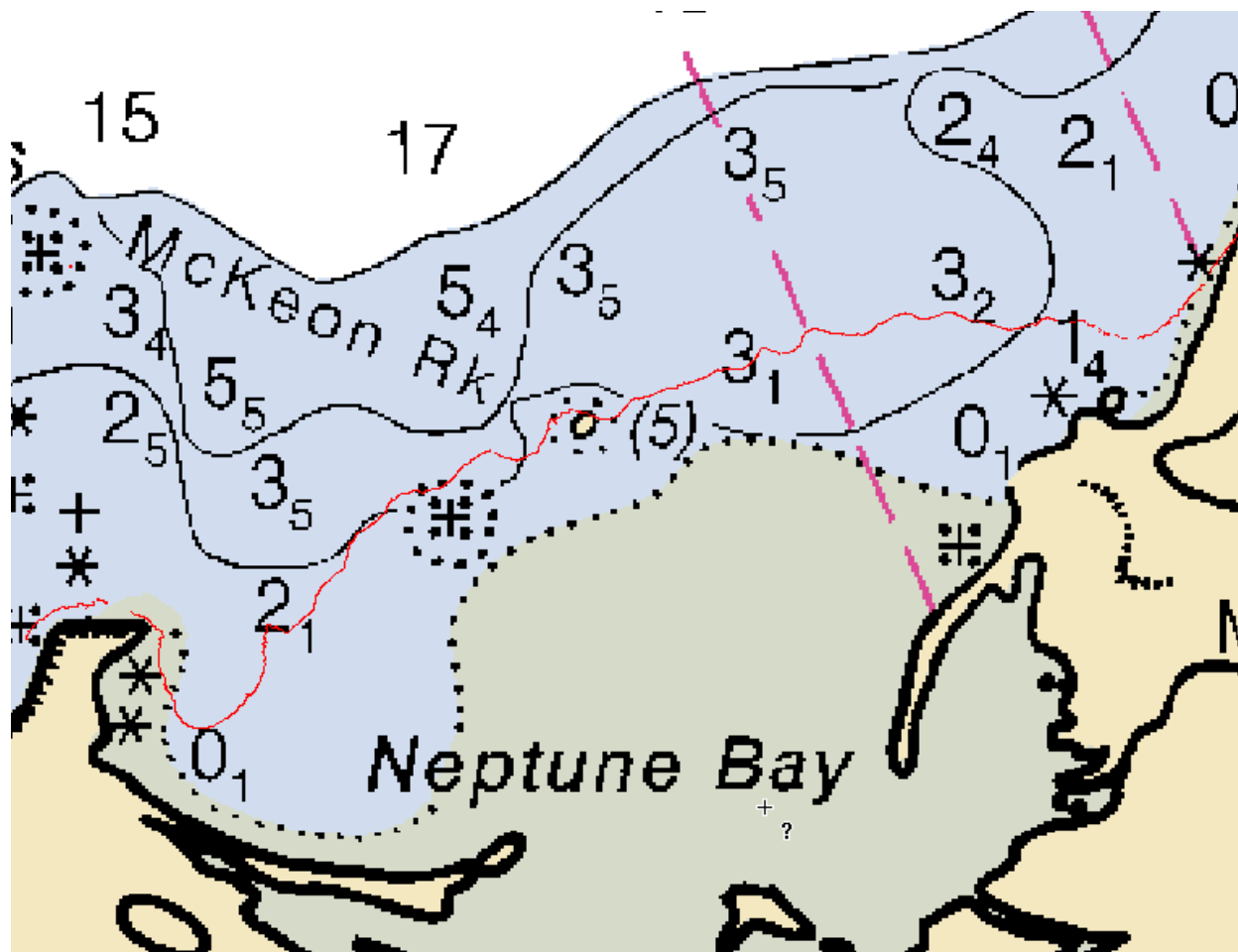
0fm 0ft (16647_1, 531_1)

.0m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090815
SORIND - US, US, NSURF, H12085

Feature Images*Figure 1.6.1*

*Figure 1.6.2*

1.7) Profile/Beam - 211/212 from h12085 / 1101_reson8125 / 2009-235 / 805_1729

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 30' 15.9" N, 151° 27' 18.1" W
Least Depth: 2.00 m (= 6.56 ft = 1.094 fm = 1 fm 0.56 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.962 m ; TVU (TPEv) ± 0.188 m
Timestamp: 2009-235.17:29:50.851 (08/23/2009)
Survey Line: h12085 / 1101_reson8125 / 2009-235 / 805_1729
Profile/Beam: 211/212
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal sounding. Shoal extends out from shore. Chart 16447 has ledge depicted accurately.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

1fm 0ft (16647_1, 531_1)

2.0m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090823
SORIND - US, US, NSURF, H12085

Feature Images

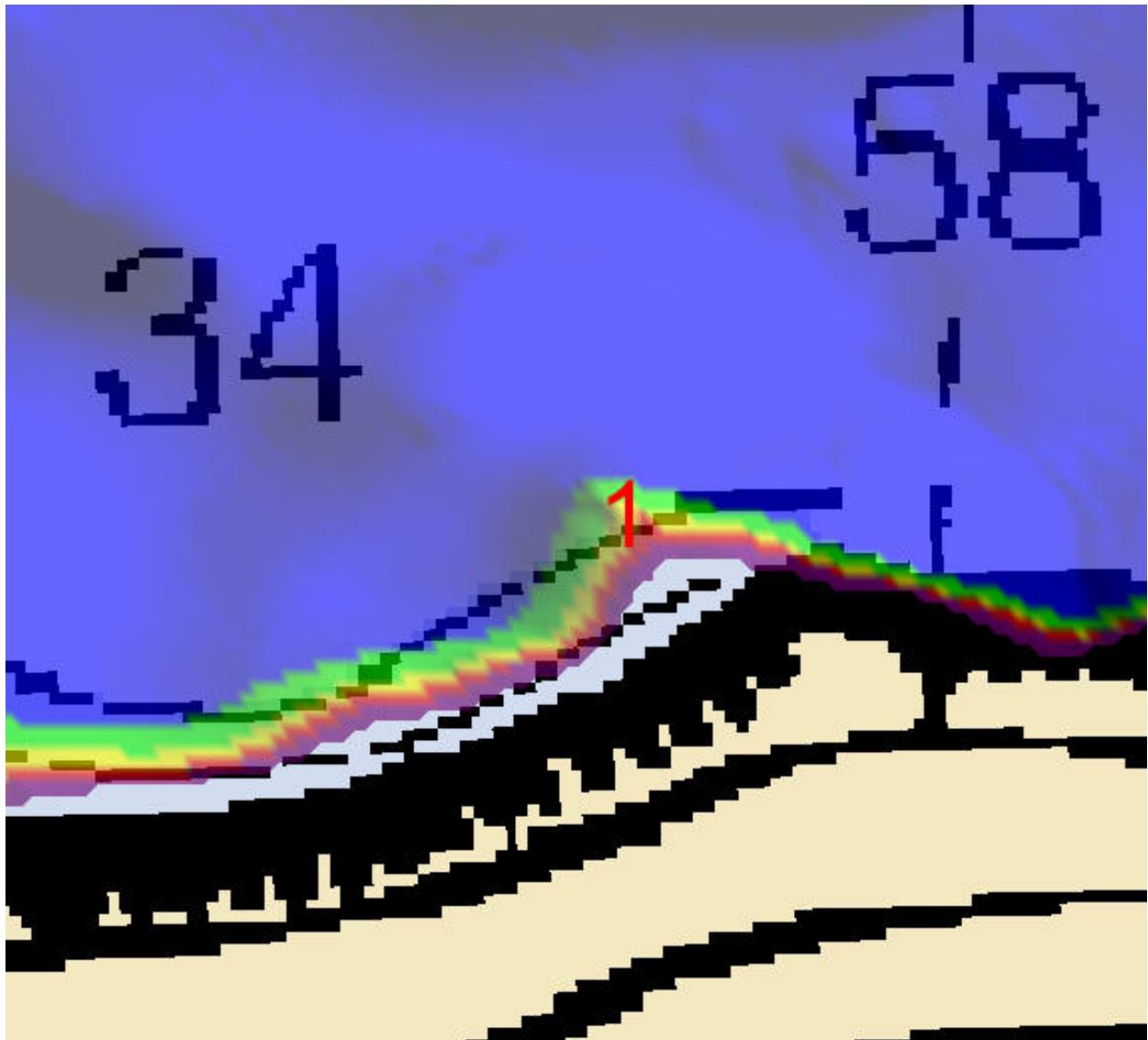


Figure 1.7.1

1.8) Profile/Beam - 35811/1 from h12085 / 1103_singlebeam_hvf / 2009-246 / 000_1655

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 32' 16.8" N, 151° 28' 47.2" W
Least Depth: 1.42 m (= 4.66 ft = 0.776 fm = 0 fm 4.66 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 3.921 m ; TVU (TPEv) ± 0.200 m
Timestamp: 2009-246.17:38:33.248 (09/03/2009)
Survey Line: h12085 / 1103_singlebeam_hvf / 2009-246 / 000_1655
Profile/Beam: 35811/1
Charts Affected: 16645_1, 16647_1, 16640_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Anti-DTON. Remove charted depth in lieu of 1 fathom 3 foot depth off shore referenced in DTON 1.11.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

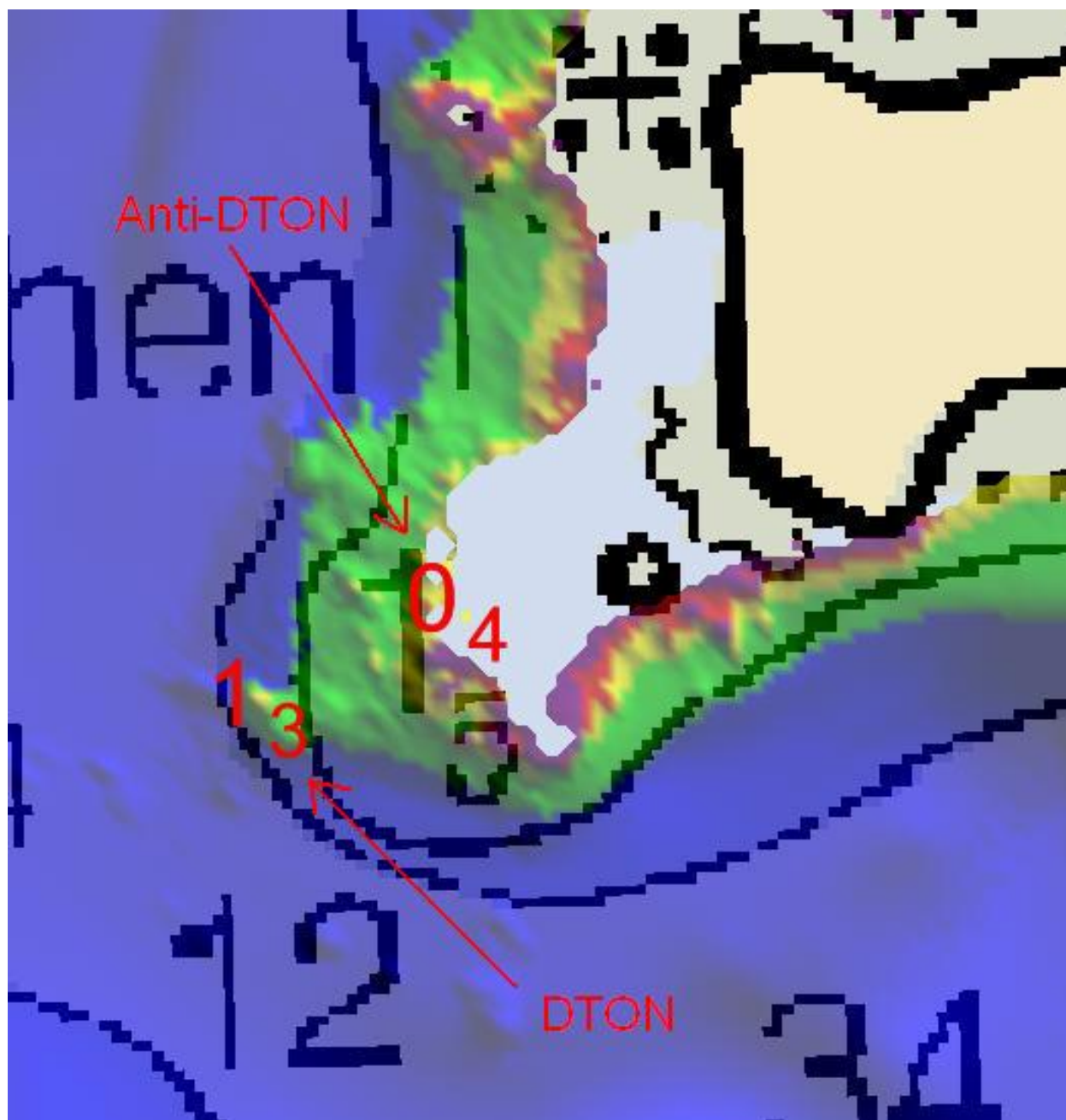
0 $\frac{3}{4}$ fm (16645_1, 16640_1, 16013_1, 530_1)

0fm 4ft (16647_1, 531_1)

1.4m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090903
SORIND - US, US, NSURF, H12085

Feature Images*Figure 1.8.1*

1.9) Profile/Beam - 214/339 from h12085 / 2801_reson7125_hf_512 / 2009-232 / 000_2313**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 59° 32' 15.0" N, 151° 27' 04.8" W
Least Depth: 4.72 m (= 15.47 ft = 2.579 fm = 2 fm 3.47 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.962 m ; **TVU (TPEv)** ± 0.183 m
Timestamp: 2009-232.23:14:01.292 (08/20/2009)
Survey Line: h12085 / 2801_reson7125_hf_512 / 2009-232 / 000_2313
Profile/Beam: 214/339
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

2 ½fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

2fm 3ft (16647_1, 531_1)

4.7m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090820
SORIND - US, US, NSURF, H12085

Feature Images

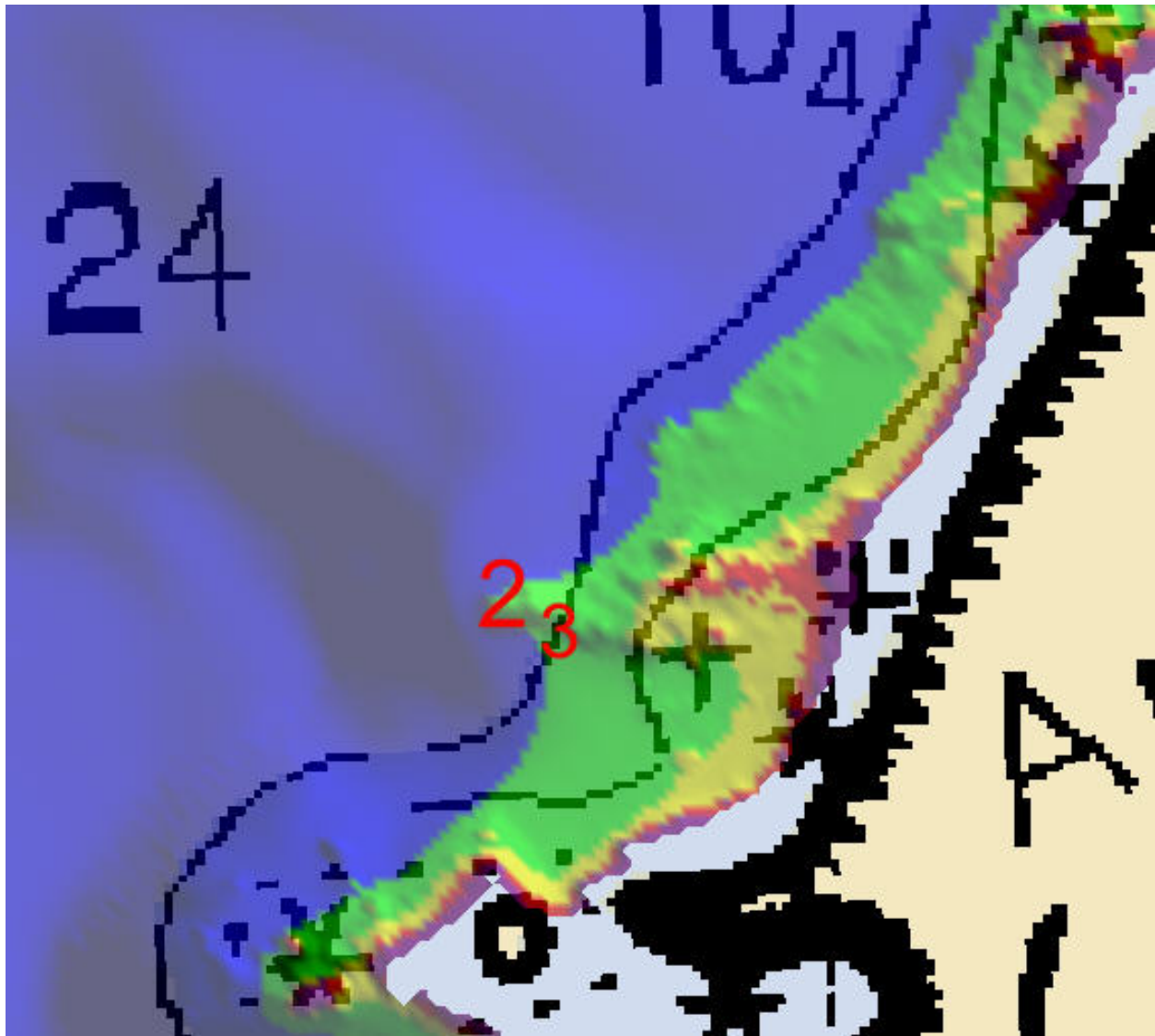


Figure 1.9.1

1.10) Profile/Beam - 739/41 from h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_0025**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 59° 33' 05.4" N, 151° 25' 00.4" W
Least Depth: 2.44 m (= 8.00 ft = 1.333 fm = 1 fm 2.00 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.961 m ; **TVU (TPEv)** ± 0.184 m
Timestamp: 2009-239.00:26:16.621 (08/27/2009)
Survey Line: h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_0025
Profile/Beam: 739/41
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

1fm 2ft (16647_1, 531_1)

2.4m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090826
SORIND - US, US, NSURF, H12085

1.11) Profile/Beam - 320/200 from h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_1742

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 32' 14.4" N, 151° 28' 57.3" W
Least Depth: 2.88 m (= 9.45 ft = 1.575 fm = 1 fm 3.45 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.961 m ; TVU (TPEv) ± 0.183 m
Timestamp: 2009-238.17:42:44.752 (08/26/2009)
Survey Line: h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_1742
Profile/Beam: 320/200
Charts Affected: 16645_1, 16647_1, 16640_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

1 ½fm (16645_1, 16640_1, 16013_1, 530_1)

1fm 3ft (16647_1, 531_1)

2.9m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090826
SORIND - US, US, NSURF, H12085

Feature Images

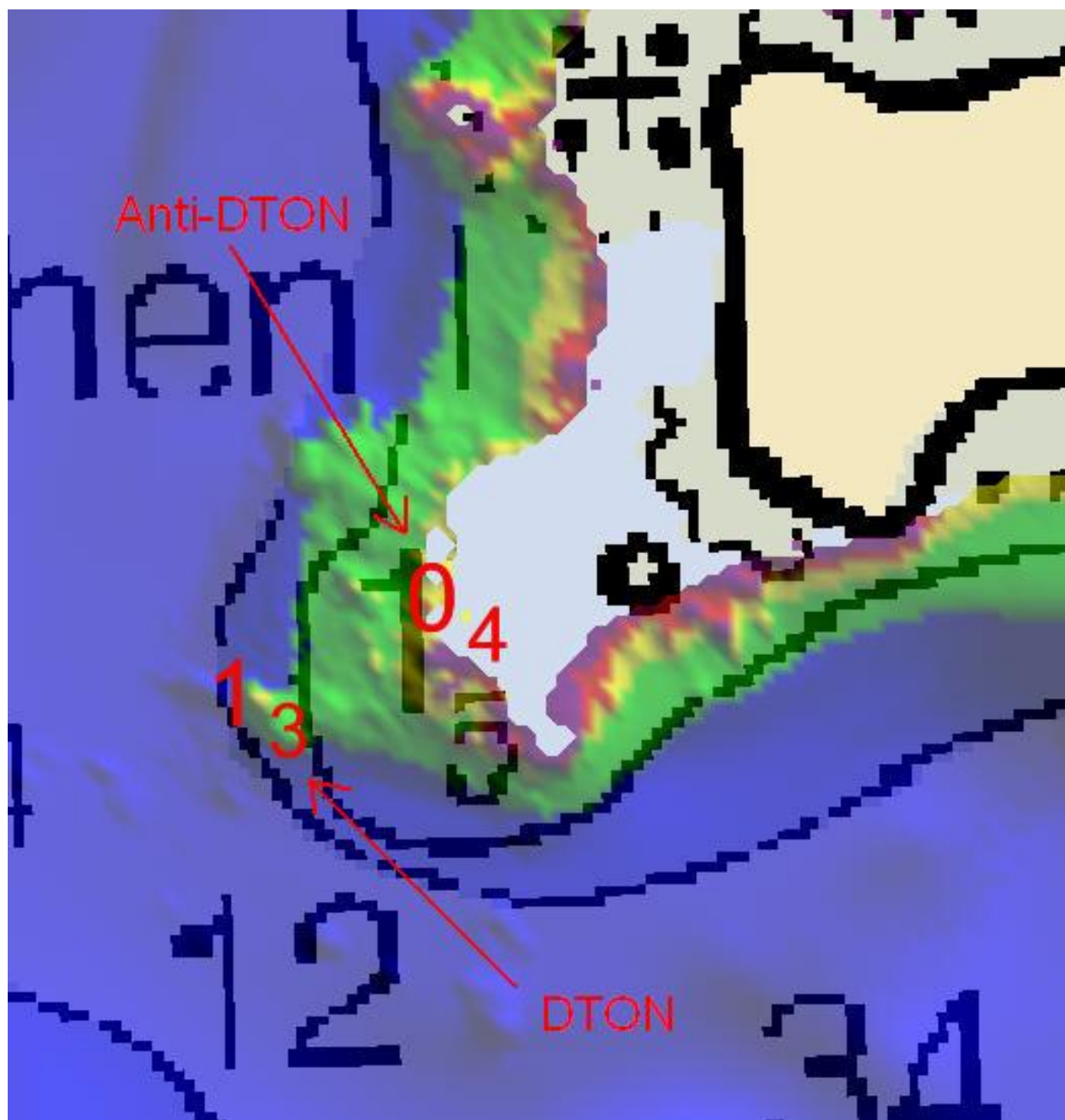


Figure 1.11.1

1.12) Profile/Beam - 2797/1 from h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_2237**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 59° 33' 12.4" N, 151° 25' 00.1" W
Least Depth: 4.27 m (= 14.02 ft = 2.337 fm = 2 fm 2.02 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.962 m ; **TVU (TPEv)** ± 0.187 m
Timestamp: 2009-238.22:40:27.093 (08/26/2009)
Survey Line: h12085 / 2801_reson7125_hf_512 / 2009-238 / 000_2237
Profile/Beam: 2797/1
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

2 ¼fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

2fm 2ft (16647_1, 531_1)

4.3m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090826
SORIND - US, US, NSURF, H12085

Feature Images



Figure 1.12.1

1.13) Profile/Beam - 373/512 from h12085 / 2802_reson7125_hf_512 / 2009-228 / 000_1820

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 31' 17.0" N, 151° 27' 05.1" W
Least Depth: 4.41 m (= 14.47 ft = 2.412 fm = 2 fm 2.47 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) ± 1.964 m ; TVU (TPEv) ± 0.191 m
Timestamp: 2009-228.18:21:37.472 (08/16/2009)
Survey Line: h12085 / 2802_reson7125_hf_512 / 2009-228 / 000_1820
Profile/Beam: 373/512
Charts Affected: 16645_1, 16647_1, 16640_1, 16680_1, 16013_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Shoal Sounding. Chart 16447 has contour depicted accurately.

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

2 ¼fm (16645_1, 16640_1, 16680_1, 16013_1, 530_1)

2fm 2ft (16647_1, 531_1)

4.4m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: SORDAT - 20090816
SORIND - US, US, NSURF, H12085

Feature Images

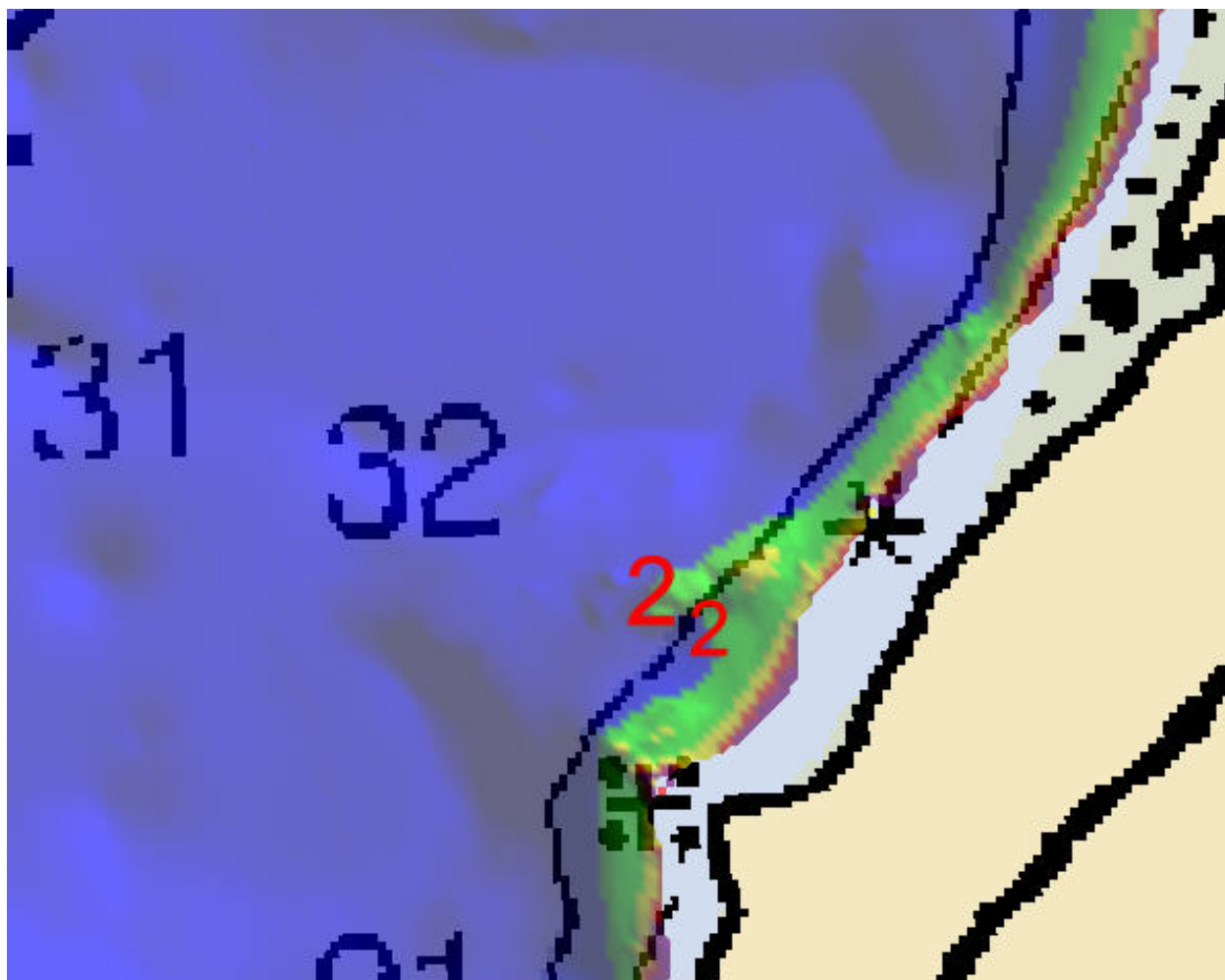


Figure 1.13.1

Subject: Chart 16645 and 16647 Discrepancies from OPR-P357-RA-FA-09

From: "foo.rainier" <foo.rainier@noaa.gov>

Date: Wed, 03 Mar 2010 15:07:21 -0900

To: Andrew.Kampia@noaa.gov

CC: Doug.Baird@noaa.gov, laurie.bennett@noaa.gov, CO Rainier <co.rainier@noaa.gov>, Gary Nelson <Gary.Nelson@noaa.gov>, "james.m.crocker" <James.M.Crocker@noaa.gov>

Andrew,

During shoreline acquisition for the Katchemak Bay Project (OPR-P357-RA-FA-09) it was noted that significant discrepancies existed between chart 16645 (1:82,662 scale) and chart 16647 (1:100,000 scale) throughout the survey project area. At the time these discrepancies were identified they were brought to the attention of Laurie Bennett, who was visiting the ship from the Marine Charting Division (MCD). The inconsistencies between these two charts have again been noted during final processing of the surveys from this project and this e-mail is intended to reiterate the inaccuracies in this area.

In spite of the fact that chart 16645 is larger scale than chart 16647, the shoreline of chart 16647 appears to have been compiled at a higher resolution than that of chart 16645. Shoreline as depicted on chart 16647 appears to be consistent with shoreline features from the most recent prior surveys and observations made during this season's shoreline acquisition. Chart 16645 has numerous inaccuracies in comparison to prior surveys and observed shoreline during this project, including many mischarted islets and rocks. While charted depths were far less dense on chart 16647, significant bathymetric features and least depths appeared to agree with survey soundings from this project and prior survey soundings far better than charted depths on chart 16645.

It appears that the most recent prior survey data may not have been applied to chart 16645, but was applied to chart 16647.

Additionally, an apparent compilation error was noted on chart 16647 in the area covered by survey H09941. While low water features are depicted on the smooth sheet for survey H09941, the mean high water (MHW) line is conspicuously absent from the smooth sheet. Chart 16647 reproduces this error depicting reefs or mean lower-low water (MLLW) lines in the place of islands. While chart 16645 does correctly depict the MHW features as islands, the location of these islands often does not match with actual observed location or the location as depicted on survey H09941.

If you would like specific examples of the discrepancies between these charts or have any other questions regarding this matter, please do not hesitate to contact me.

V/R,
LT Brent Pounds
Field Operations Officer
NOAA Ship /Rainier/



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 6, 2009

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P357-RA-2009
HYDROGRAPHIC SHEET: H12085

LOCALITY: Eldred Passage and Sadie Cove, Kachemak Bay, AK
TIME PERIOD: August 12 - September 4, 2009

TIDE STATION USED: 945-5500 Seldovia, AK
Lat. 59° 26.4' N Long. 151° 43.2' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 5.252 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P357-RA-2009, H12085, during the time period between August 12 and September 4, 2009.

Please use the zoning file "P357FARA2009CORP" submitted with the project instructions for OPR-P357-FA/RA-2009. Zones CIC41, CIC42, CIC43, & CIC44 are the applicable zones for H12085.

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: 2009.10.09 08:09:12 -04'00'

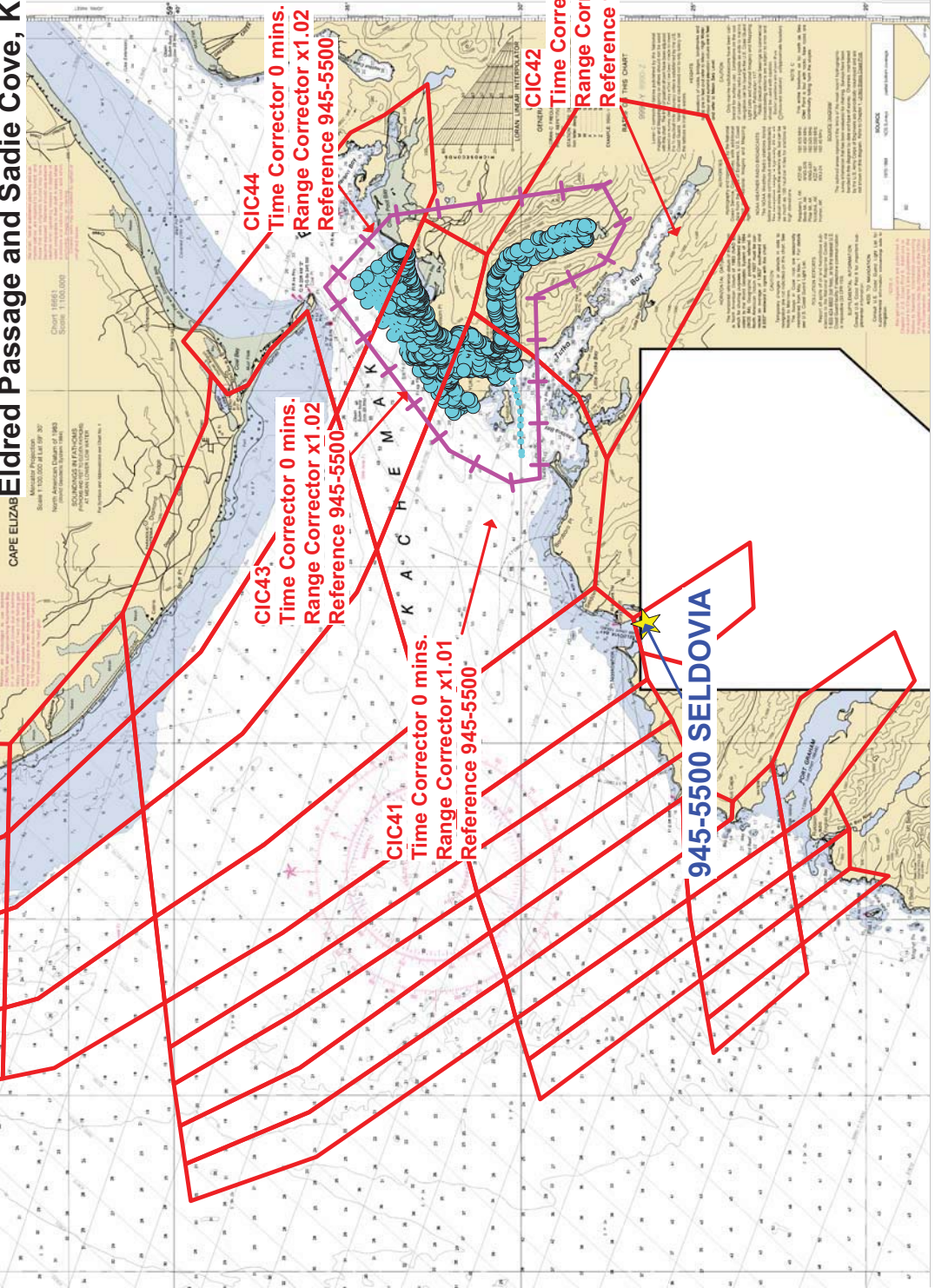
CHIEF, OCEANOGRAPHIC DIVISION



SOUNDINGS IN FATHOMS
FATHOMS AND FEET TO 11 FATHOMS

**Preliminary As Final Tidal Zoning
co for OPR-P357-RA-2009, H120855**

Eldred Passage and Sadie Cove, Kachemak Bay, AK



H12085 HCell Report
Fernando Ortiz, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H12085 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March 2010.
HCell Reference Guide: Version 2.0, July 29, 2010.

2. Compilation Scale

Depths and features for HCell H12085 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16645	1:82,662	19th	07/2010	09/07/2010

The following ENC's were also used during compilation:

Chart	Scale
US5AK1BM	

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 8-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 for the 16645 chart at survey scale using a Radius Table file with values shown in the table, below.

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

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

4. Depth Contours

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

Chart Contour Intervals in fathoms from Chart 16645	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H12085_SS.000
0	0	0.2286	0	0
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.5166	10.125	10
50	91.44	92.8116	50.75	50

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

5. Meta Areas

The following Meta object areas are included in HCell H12085:

M_QUAL

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

6. Features

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

7.S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
\$LINES	Cable power
DEPCNT	Zero contour lines

M_QUAL	Data quality Meta object
SLCONS	Shoreline Contruction
SBDARE	Bottom samples- rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rocks

The *_SS HCell contains the following Objects:

DEPCNT	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

H12085 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

H12085_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1: 82,662
H12085_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H12085_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12085_outline.gml	Survey outline
H12085_outline.xsd	

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.0	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.1	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1, SP 1	Validation of the base cell file.
Northport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

Fernando Ortiz
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206.526.6859
Fernando.ortiz@noaa.gov.

APPROVAL SHEET
H12085

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

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

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