

F00558

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. N/A

Registry No. F00558

LOCALITY

State Alaska

General Locality North Coast of Kodiak Island

Sublocality Womens Bay Approaches and Harbor

.....
2008
.....

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;">F00558</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>North Coast of Kodiak Island</u></p> <p>Sub-Locality <u>Womens Bay Approaches and Harbor</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>7/24/2008-7/28/2008</u></p> <p>Instructions dated <u>6/25/2008</u> Project No. <u>OPR-P136-RA-08</u></p> <p>Vessel <u>RA1 (1001), RA4 (2801)</u></p> <p> </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>Knudsen 320M, Reson SeaBat 7125</u></p> <p>SAR by <u>Andrew Clos</u> Compilation by <u>Tyanne Faulkes</u></p> <p>Soundings compiled in <u>Feet</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. All separates are filed with the hydrographic data. Revisions and end notes in red were</u></p> <p><u>generated during office processing. Page numbering may be interrupted or non sequential.</u></p> <p> </p> <p> </p>		

Descriptive Report to Accompany Hydrographic Survey F00558

Project OPR-P136-RA-08
North Coast of Kodiak Island, Alaska
Womens Bay Approaches and Harbor
Scale 1:10,000
July 24-July 28
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 Letter Instructions OPR-P136-RA-08 dated June 25, 2008 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is Womens Bay Approaches and Harbor. This survey corresponds to sheet “A” in the sheet layout provided with the Letter Instructions.

OPR-P136-RA-08 responds to a request from John Matthews at the USCG Facilities Design and Engineering Center. The survey area is located in front of three piers for comparison to the 1999 survey data in order to allow USCG to assess the extent of silting, if any. The shoal resurvey is also included for navigational safety in order to incorporate plans to harbor deep draft vessels in the future.

Complete multibeam echo sounder (MBES) coverage was obtained in the survey area in waters 4 meters and deeper.¹ Object Detection Coverage was acquired to identify least depths over any designated AWOIS items or any significant features or shoals, as appropriate for this survey. The total mileage acquired by each vessel and system is referenced below in Table 1.

Limited Shoreline Verification was performed for survey F00558.

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

Data Acquisition Type	Hull Number with Mileage (nm)					Total
	1101	1103	1021	2801	2802	
MBES (main scheme)	4.8	-	-	24.6	-	29.4
Cross lines	-	-	-	3.0	-	3.0
Holidays	-	-	-	0.3	-	0.3
Developments	-	-	-	-	-	-
Bottom Samples	-	-	-	-	-	-
Total Number of Items Investigated	-	-	-	-	-	8
Total Area Surveyed (sq. nm)	-	-	-	-	-	0.24

Table 1: Statistics for survey F00558

Data acquisition was conducted from July 24 to July 28, 2008 (DN 206 to DN 210).

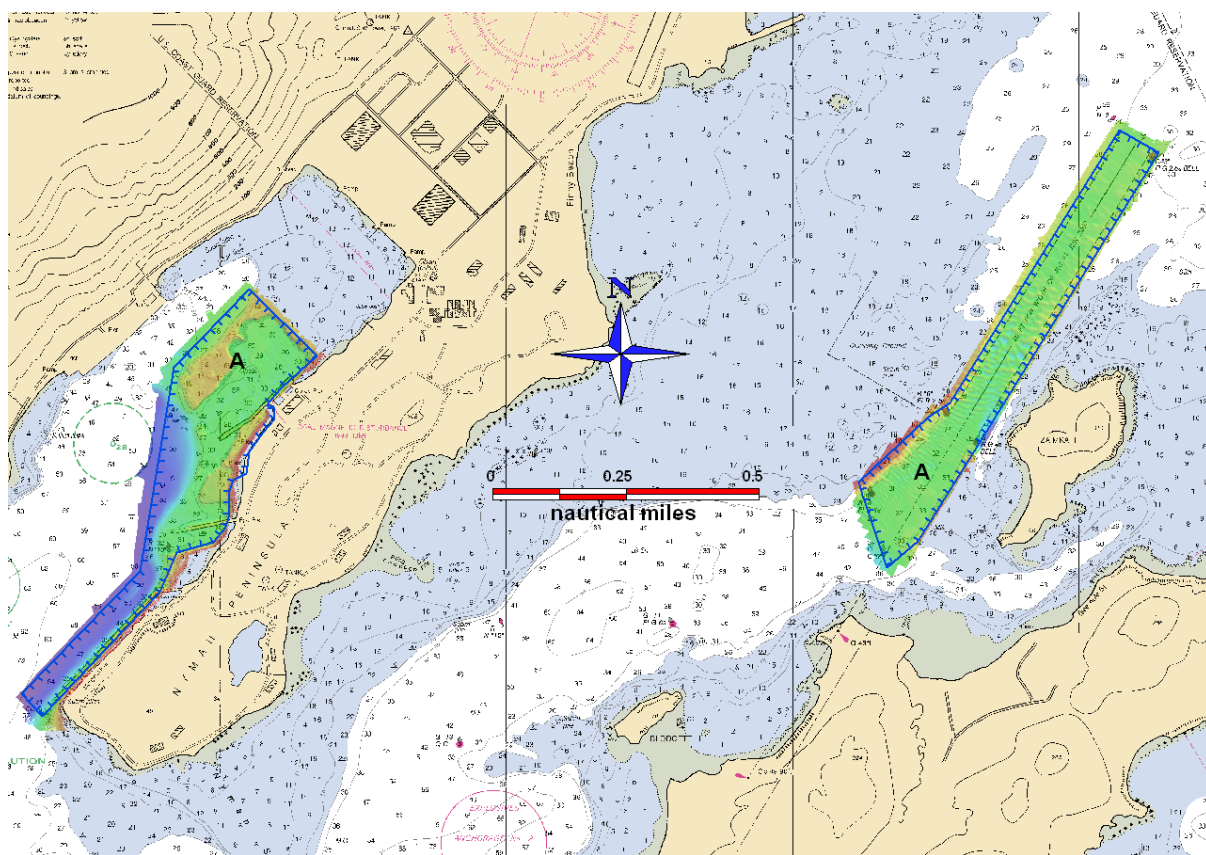


Figure 1: F00558 Survey Limits overlaid on Chart 16596

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-P136-RA-08 Data Acquisition and Processing Report (DAPR)*², submitted under separate cover. Items specific to this survey, and any deviations from the DAPR are discussed in the following sections.

Final Approved Water Levels have been applied to this survey. See Section C. for additional information.

B1. Equipment and Vessels

The following vessels acquired data for this survey:

Hull Number	Name	Acquisition Type
1101	RA-1	Multibeam Echo sounder Detached Positions
2801	RA-4	Multibeam Echo sounder

Table 2: Data Acquisition Vessels for F00558

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

Cross lines

Multi-Beam Echo sounder (MBES) cross lines totaled 3.0 nautical miles, comprising 10.2 % 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 less than 0.2 meters.³

A statistical Quality Control Report has been conducted on representative data acquired with each system used on this survey. Results of these tests are included in the updated 2008 RAINIER Hydrographic System Readiness Review package submitted with this survey.

Junctions

No surveys junction with OPR-P136-RA-08, F00558.⁴

Sound Speed Artifacts

Due to river runoff and weather conditions, a profound demarcation of water masses was observed in Womens Bay Harbor. The acquisition and application of sound speed correctors proved to be problematic in this area. In an attempt to help mitigate the sound speed errors, launch crews would take casts at closer intervals whenever the surface sound speed appeared to change rapidly. However, despite the efforts of the Hydrographer to conduct sufficient sound speed casts both spatially and temporally, sound speed uncertainties were visible in the area. During processing, sound speed casts were concatenated into SVP files by day and applied using the nearest in distance within time function. A time frame of 4 hours was primarily selected. The data continued to possess the characteristic “frowns” indicative of inaccurate sound speed corrections. (See Figures 2 and 3) To compensate, the Hydrographer planned splits between lines already run in the area of Womens Bay Harbor in order to obtain a better representation of the actual depth in the area. The Hydrographer, where possible, rejected soundings obviously in error on the outer beams. With the additional data from splits and the data cleaning, the surface deviations were mitigated and the submitted surfaces are within specifications.⁵



Figure 2: Example of sound speed artifacts in survey F00558

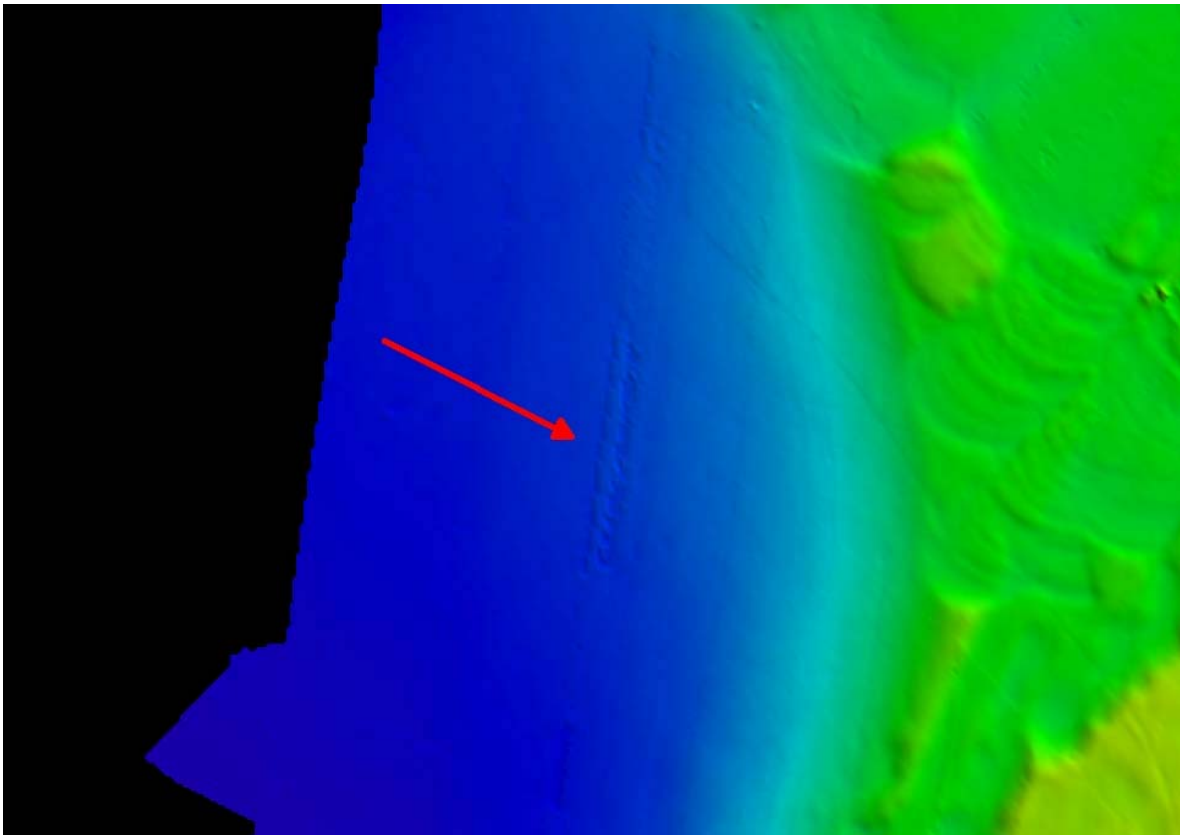


Figure 3: Example of sound speed artifacts on BASE surface

Holidays

There is one holiday in F00558 indicated in Figure 4; it is in shallow water inside the USCG Cargo Pier in Womens Bay Harbor. The inside of the pier is used as a small boat basin and although the survey vessel made many passes, this holiday was not surveyed.⁶

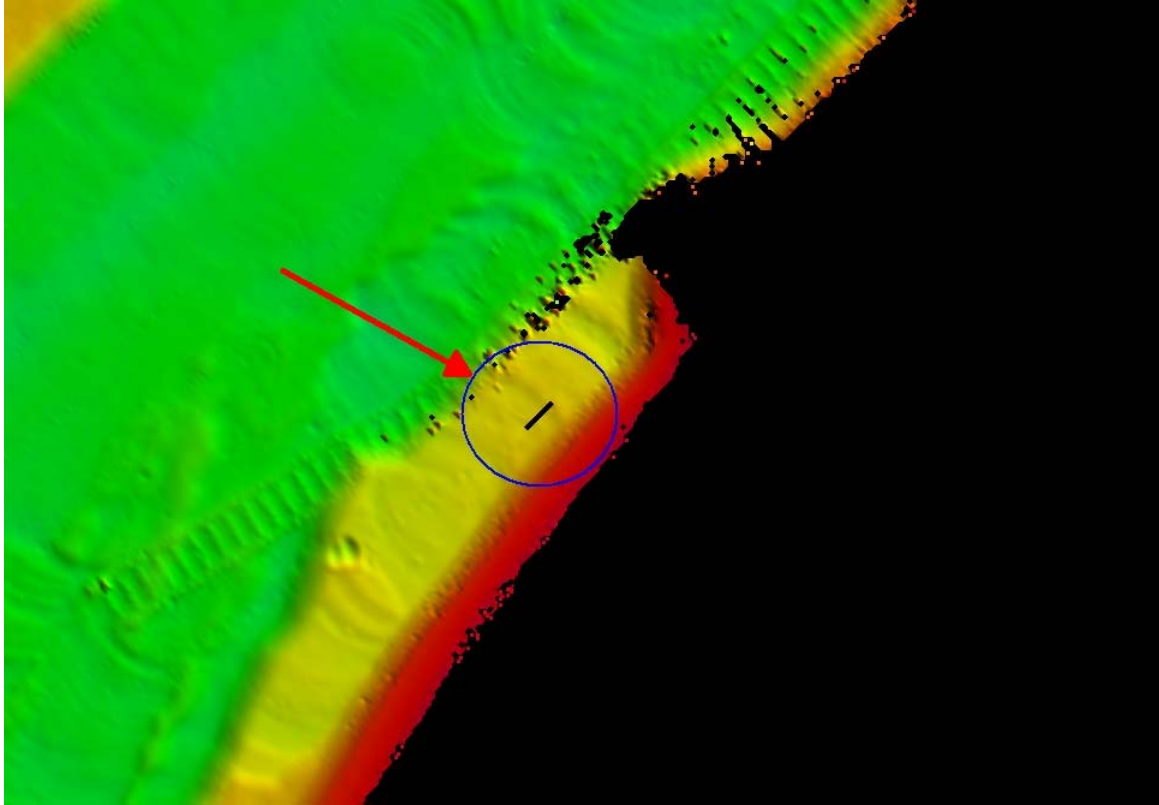


Figure 4: Holiday in survey F00558

The submitted surfaces show other gaps in coverage, but all are shoreward of the 4 m curve or underneath pier faces and cartographically insignificant. Figure 5 illustrates gaps in coverage along the face of the pier and piles above the surface of the water.⁷

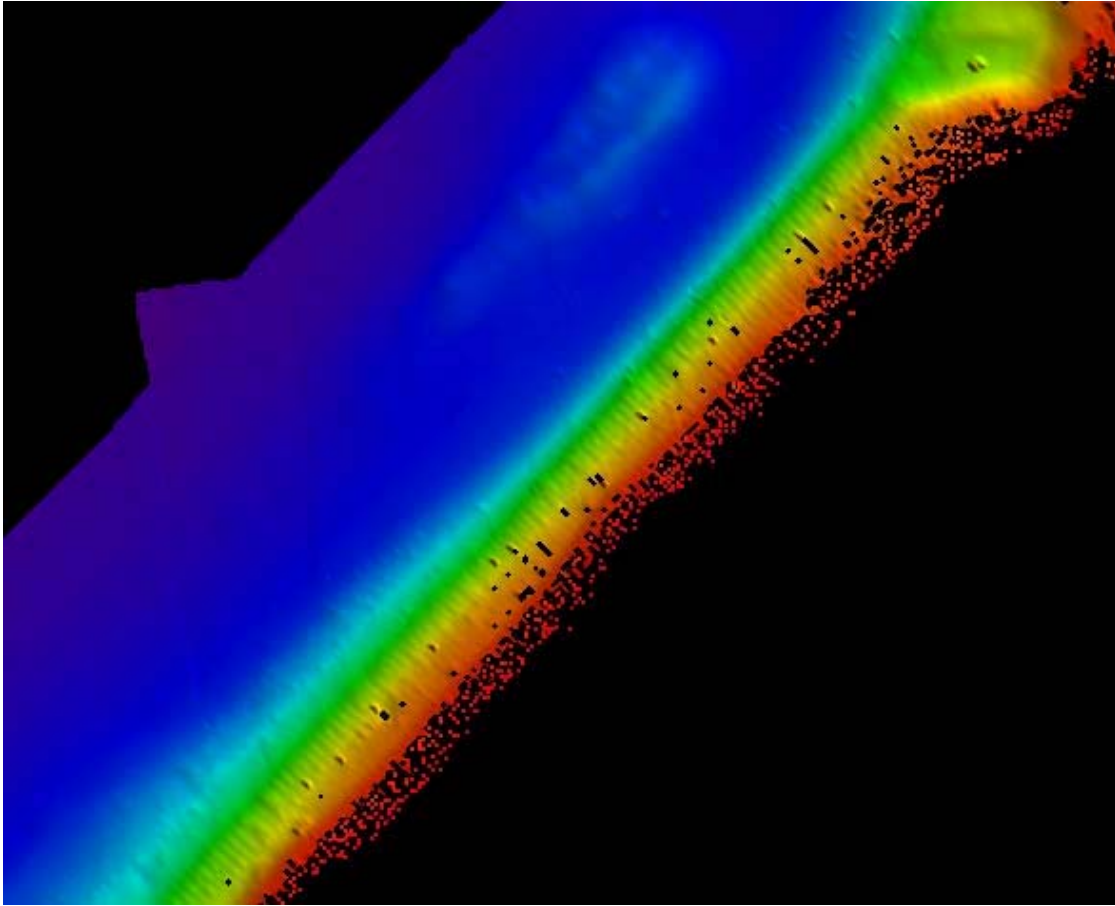


Figure 5: Example of gaps under a pier face in survey F00558

Work barge near Fuel Pier on DN 207

On July 25, day number 207, a construction barge was working on the north side of the fuel pier in Womens Bay. Data collected on this day show a spud that was deployed from the barge to help it keep its position. The spud data are in approximate position 57° 43.6' N, 152° 31.0' W. The barge is not a permanent feature and data from the previous day show that those data are from the barge and not from any permanent, submerged object. The data have been rejected and should be disregarded for charting purposes.⁸

B3. Data Reduction

Data reduction procedures for survey F00558 conform to those detailed in the *OPR-P136-RA-08 DAPR*.

B4. Data Representation

The bathymetry in F00558 is shallower than 25 m throughout and a 1 meter BASE surface was created to represent the entire survey area. The final BASE surface resolutions and depth ranges are set in accordance with Specifications and Deliverables Complete Multibeam Coverage requirements. Field sheets have a grid resolution of at least 10% of the depth and are smaller than 25×10^6 nodes. The highest resolution BASE surface being submitted with survey F00558 is 1.0 m. The depth ranges used in survey F00558 are shown in Table 3 below. The submission Field Sheet and BASE surface structure and layout is shown in Figure 6.⁹

Depth Ranges for Finalized Surface	Resolution
0 – 21.5 m	1 m

Table 3: Depth ranges and resolution of BASE Surfaces

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

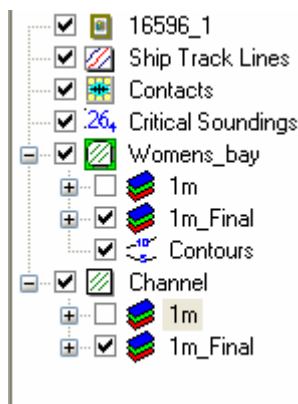


Figure 6: Field sheets and BASE surfaces submitted with F00558

F00558 included many areas of surveying in and around pier faces and other cultural features such as piers, dolphins, and pilings. In order to avoid the BASE surface misrepresenting the sea floor, all data on cultural features that rise out of the water and are represented as features on the Field verified layer have been rejected in Caris in accordance with email correspondence with the Hydrographic branch. Please see Appendix V for email correspondence and a more thorough discussion of how Multibeam data on cultural features were flagged.¹⁰

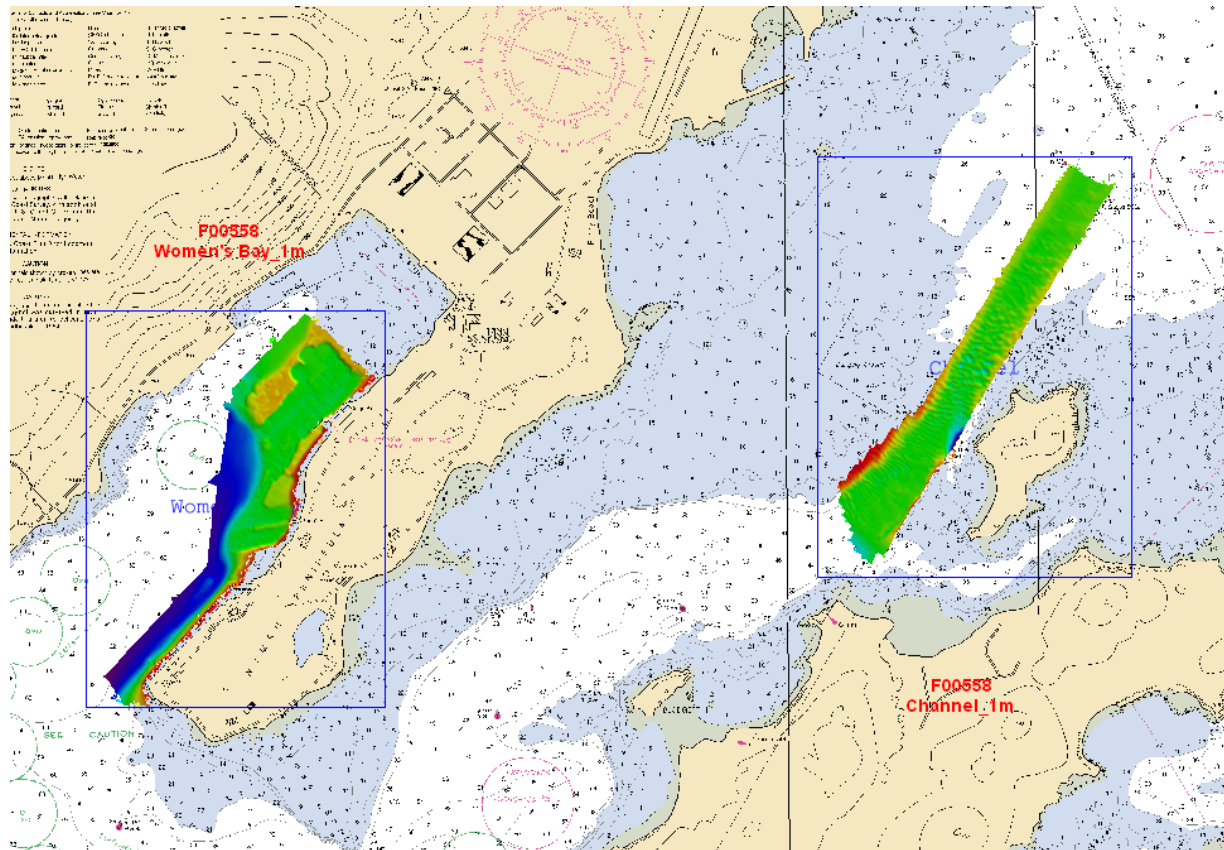


Figure 7: Layout of Field Sheets and BASE surfaces overlaid on chart 16596

C. VERTICAL AND HORIZONTAL CONTROL

OPR-P136-RA-08 did not require static GPS observations or other horizontal control work, and all tide corrections were generated from CO-OPS maintained tide stations. No Horizontal and Vertical Control report will be submitted.¹¹

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Due to the numerous cultural features such as pier faces in the survey area and due a nearby Continuously Operating Reference Stations (CORS) site, dual frequency GPS was logged through the POS MV to a POS file. The resulting POS data were post processed using Applanix POSPac v. 5.1 software in order to achieve sub-meter horizontal accuracy. NGS station KOD6 was used as the reference station for post processing; the resultant Smoothed Best Estimate of Trajectory (SBET) file is included in the raw data. In all cases the positioning uncertainty of the post processed SBET is less than 1 m. The SBET files were applied to the data using the Caris HIPS and SIPS “Load attitude and navigation” function.

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 Kodiak Island, AK (945-7292) served as control for datum determination and as the primary source for water level reducers for survey F00558.

No tertiary gauges were required.

All data were reduced to MLLW using **final approved water levels** from station Kodiak Island, AK (945-7292) using the tide file 9457292.tid and final time and height correctors using the zone corrector file P136RA2008CORP.zdf.

The request for Final Approved Water Levels for F00558 was submitted to CO-OPS on July 31, 2008 and the Final Tide Note was received on August 15, 2008. This documentation is included in Appendix IV.¹²

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey F00558 was compared with the following charts¹³:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
16596_1	1:10,000	12 th Ed, Aug 2002	06/07/08
16595_1	1:20,000	15 th Ed, Feb 2004	06/07/08

Table5: Charts compared with F00558

Chart 16596:

All charted depths in Womens Bay Harbor and Channel agree well with survey soundings with discrepancies no greater than 3 feet. The charted 5 ft obstruction at the southwest tip of Nyman Peninsula was not detected with object detection MBES. Please see section D.1.C for specific recommendations on this AWOIS feature.

Survey soundings in the controlled channel are all at or deeper than the charted 28 ft notation. Throughout the channel, most survey soundings are deeper than 33 ft but on the south east side of the channel, a few shoals are encroaching from outside the channel and have least depths of 28 and 29 ft.¹⁴

Chart 16595:

All charted depths in Womens Bay Harbor and Channel agree well with survey soundings with discrepancies no greater than ½ fathom with the following exceptions. The 5 ¾ fathom charted depth located off the southwestern portion of Nyman Peninsula off the Marignal Pier was surveyed with complete MBES. Survey soundings in the area are between 7 and 8 fathoms. The Hydrographer notes that a similar depth is not indicated on chart 16596 and recommends removing the charted 5 ¾ fm sounding and charting as per the digital data. The Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.¹⁵

Survey soundings in the controlled channel are all at or deeper than the charted 28 ft notation. Throughout the channel, most survey soundings are deeper than 33 ft but on the south east side of the channel, a few shoals are encroaching from outside the channel and have least depths of 28 and 29 ft.¹⁶

ENC and Composite Source:

All features were compared to the provided composite source file in lieu of an ENC chart comparison. The piers and pilings in the survey area were not properly positioned on the chart or composite source. Pier and piling positions were modified in the Field Verified hob file to correspond with survey Detached Positions and multibeam data.

A floating small boat pier has been installed on the inside of the cargo pier in Womens Bay. The corners of the floating pier were positioned with GPS and the structure has been added to the Field Verified hob file and should be charted as such.¹⁷

Two submerged features were added to the Field Verified hob file and are discussed in detail below in section D.1.c.

D.1.b. Dangers to Navigation

No dangers to navigation (DTONs) were found in survey F00558.¹⁸

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

Eight (8) AWOIS items fall within the survey limits of F00558. All eight items were assigned for full investigation. Object detection MBES coverage was obtained over AWOIS items assigned for full investigation.

The charted obstruction (AWOIS 52-464) located northwest of the cargo pier in Womens Bay Harbor, as illustrated in Figures 8 and 9, was detected with MBES as charted. The obstruction appears to not have changed since the dive investigation of 1999: it appears to consist of two containers. Current surveyed least depth is 2.59 m (8.5 ft). The Hydrographer recommends charting the obstruction with current survey data.¹⁹

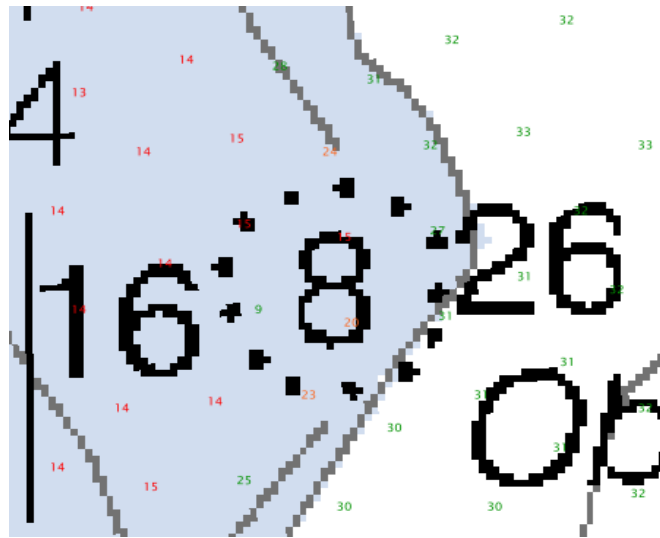


Figure 8: Charted (AWOIS 52-464) on chart 16596

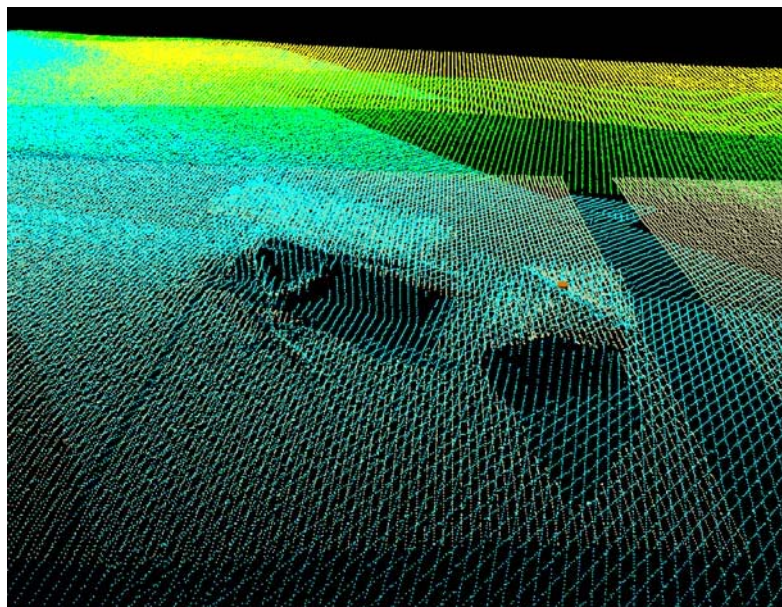


Figure 9: Charted (AWOIS 52-464) in CARIS Subset Editor-3D View

The charted dolphin (AWOIS 52-462) located at the northeast end of the Cargo Pier in Womens Bay Harbor, as illustrated in Figures 10 and 11, was seen from the surface and detected with MBES. The Hydrographer recommends repositioning the charted dolphin as per the digital MBES data and field verified hob file.²⁰

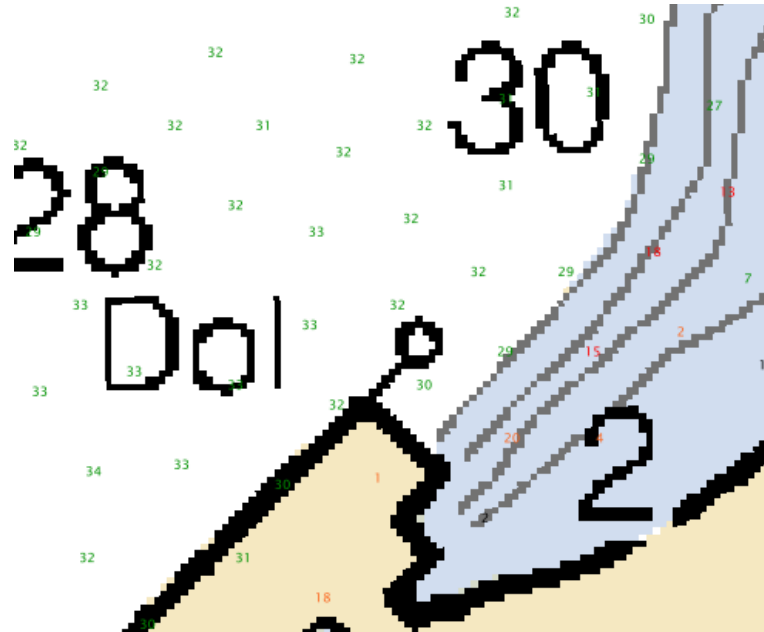


Figure 10: Charted (AWOIS 52-462) on chart 16596

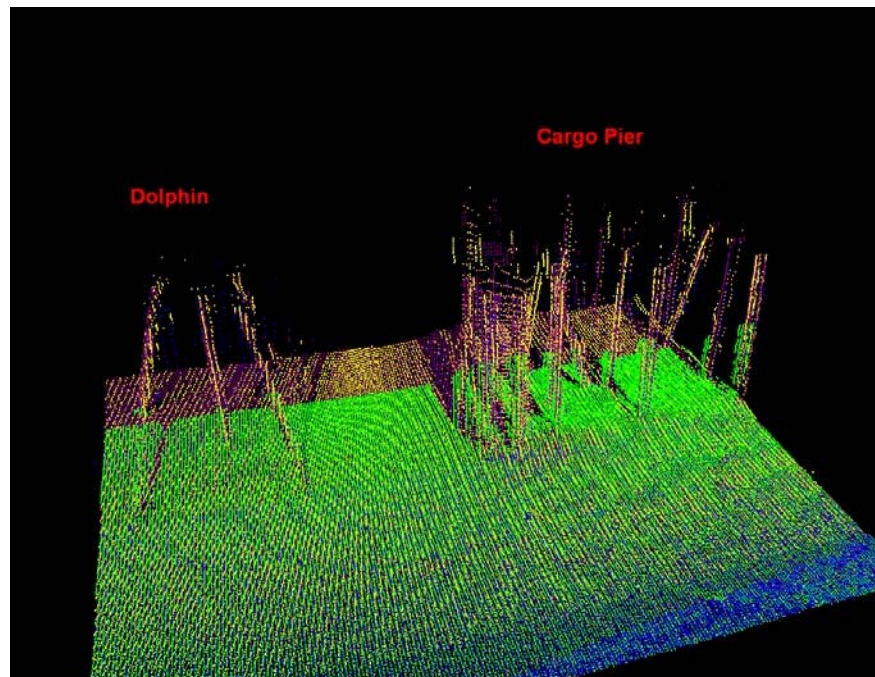


Figure 11: Charted (AWOIS 52-462) in CARIS Subset Editor-3D View

The charted dolphin (AWOIS 53-696) located at the west end of the Fuel Pier in Womens Bay Harbor, as illustrated in Figure 12, was observed from the surface and detected with complete MBES. The charted position of the dolphin does not correspond with the surveyed position. Construction has taken place on this pier since the item was last investigated in 1999: there is a walkway that extends from the fuel pier to the dolphin where the currently charted submerged pier ruins are charted. The positions and status of the pier and dolphin have been updated in the Notebook hob files. The Hydrographer recommends charting the dolphin and fuel pier as per the field verified hob file.²¹

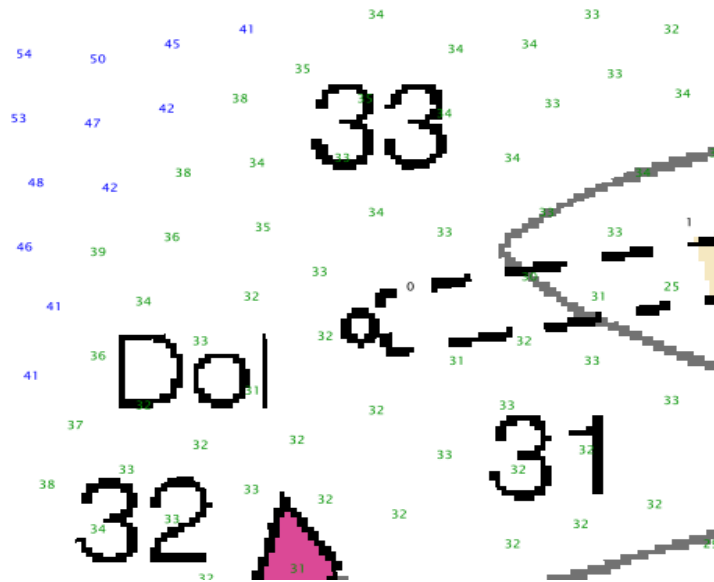


Figure 12: Charted (AWOIS 53-696) on chart 1659, the “0” sounding indicates the surveyed location of the dolphin

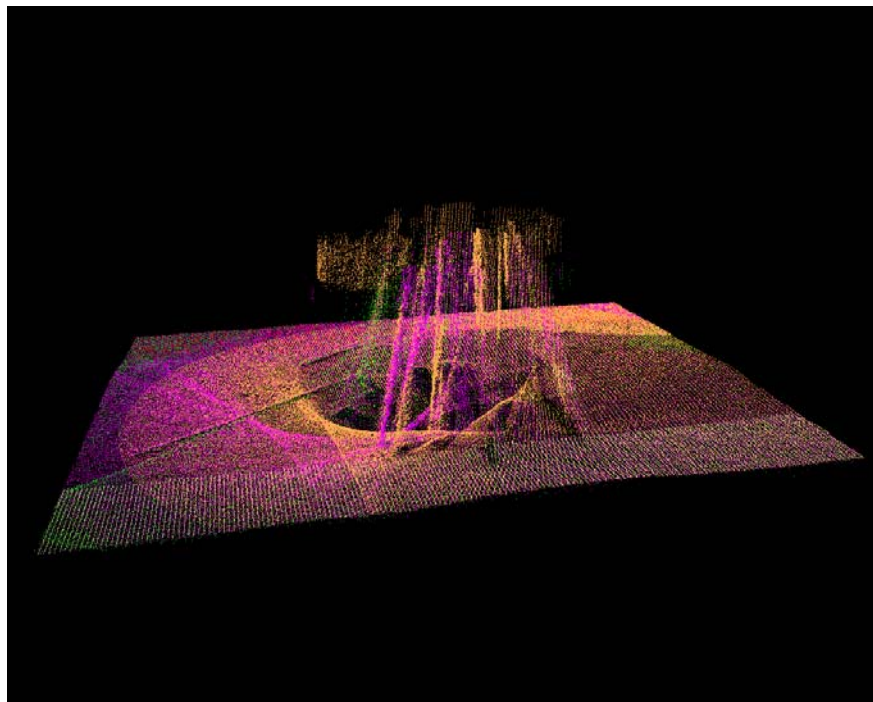


Figure 13: Charted (AWOIS 53-696) in CARIS Subset Editor-3D View

The charted submerged obstruction feature (AWOIS 52-460) located at the northeast corner of Marginal Pier in Womens Bay Harbor, as illustrated in Figure 14, was investigated with MBES. Although several insignificant features were identified at the charted position, the most significant contact in the area is approximately 20 m to the north east of the charted position, Figure 15. This obstruction has a least depth of 5.50 m (18 ft). The Hydrographer recommends removing the current charted obstruction and charting the obstruction identified as per the field verified hob file and supporting MBES data.²²

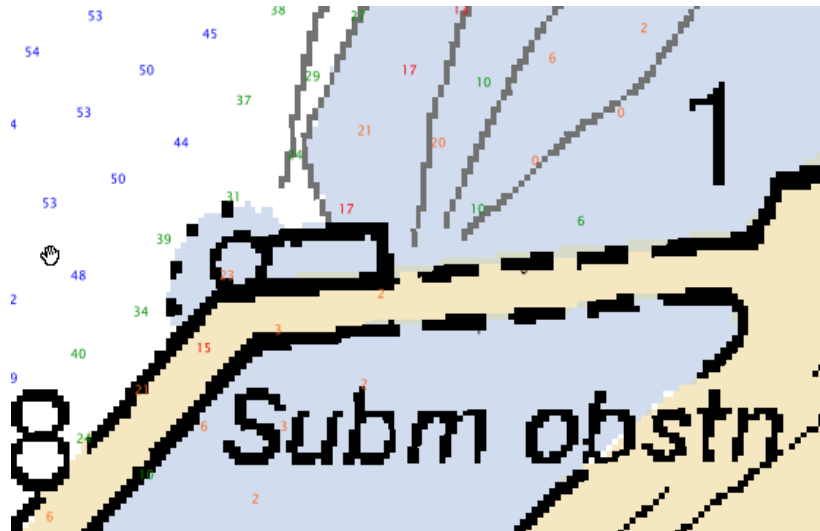


Figure 14: Charted (AWOIS 52-460) overlaid on chart 16596

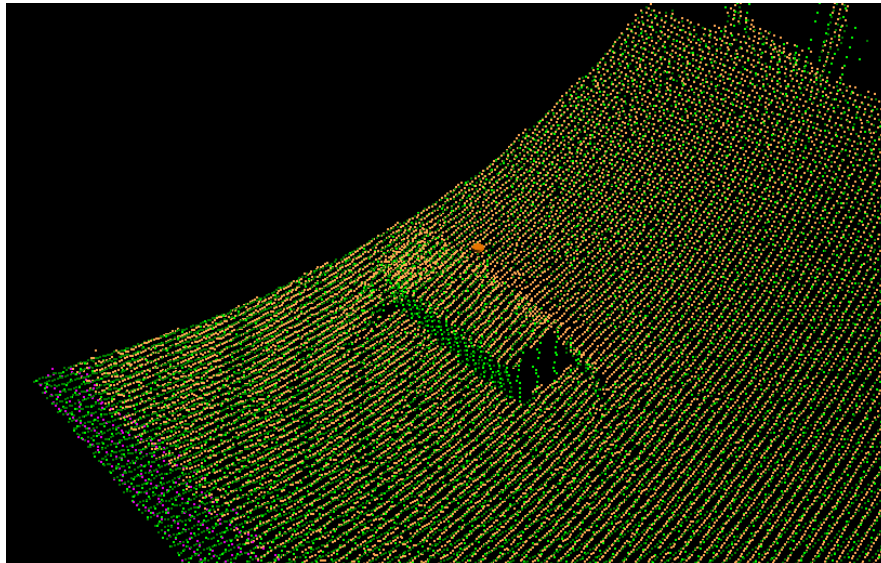


Figure 15: Obstruction to the NE of AWOIS 52-460 displayed in HIPS subset

The charted submerged pipe (AWOIS 52-459) and submerged pile (AWOIS 52-458) located on Marginal Pier in Womens Bay Harbor, as illustrated in Figure 16, were investigated with MBES. Several unknown features along the bottom were detected as illustrated in Figure 17. The least depths of the two most prominent features were designated in HIPS and correspond well with the charted position of the AWOIS items. The feature that corresponds to AWOIS 52-459 is a vertical feature very close to the pier face with least depth of 5.25 m (17 ft). The feature that corresponds to AWOIS 52-458 is a horizontal feature that extends from the downward slope of the sea floor with least depth 11.14 m (36 ft). The Hydrographer recommends retaining the submerged pipe and the submerged pile as charted on 16596 and adding these items to chart 16595.²³



Figure 16: Charted (AWOIS 52-459,458) overlaid on chart 16596

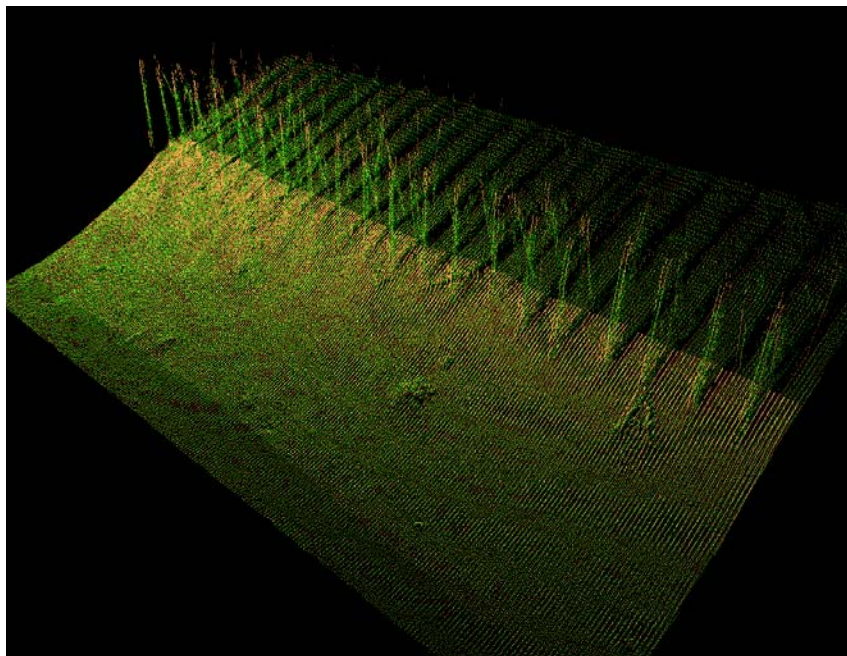


Figure 17: Charted (AWOIS 52-459,458) in CARIS Subset Editor-3D View

The charted submerged piles (AWOIS 53-695) located at the south end of Marginal Pier in Womens Bay Harbor, as illustrated in Figure 18, were investigated with MBES. Several submerged piles were detected as illustrated in Figure 19. The Hydrographer recommends retaining submerged piles as charted.²⁴



Figure 18: Charted (AWOIS 53-695) in on chart 16596

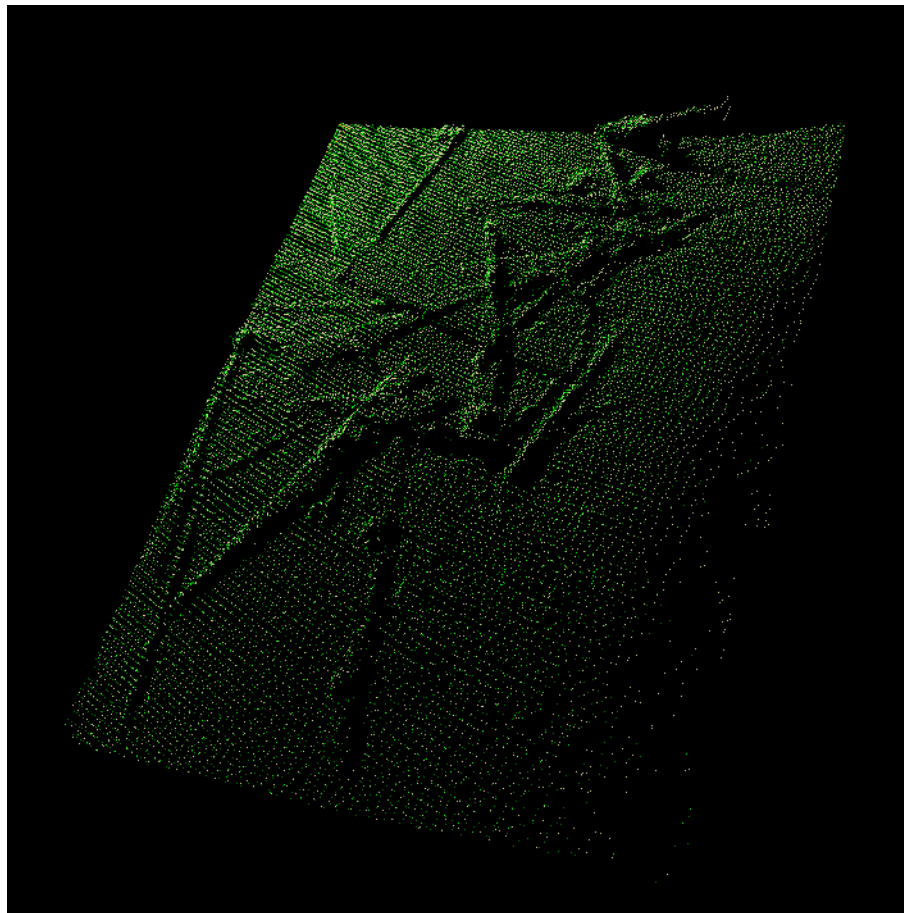


Figure19: Charted (AWOIS 53-695) in CARIS Subset Editor-3D View

The charted obstruction (AWOIS 53-694) located at the southwest end of Marginal Pier in Womens Bay Harbor, as illustrated in Figure 20, was investigated with object detection MBES. The only feature in the search radius is a small box, possibly an anchor block that stands less than 0.5 m proud of the seafloor. It is insignificant, especially when compared to the steep slope in the area. The Hydrographer recommends removing the obstruction from chart 16596 and updating charts 16596 and 16595 as per the digital data.²⁵

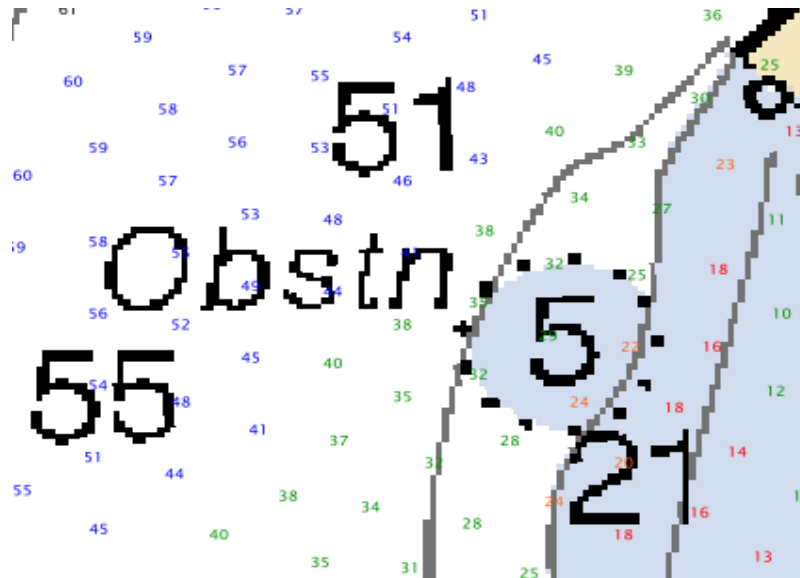


Figure 20: Charted (AWOIS 53-694) overlaid on chart 16596

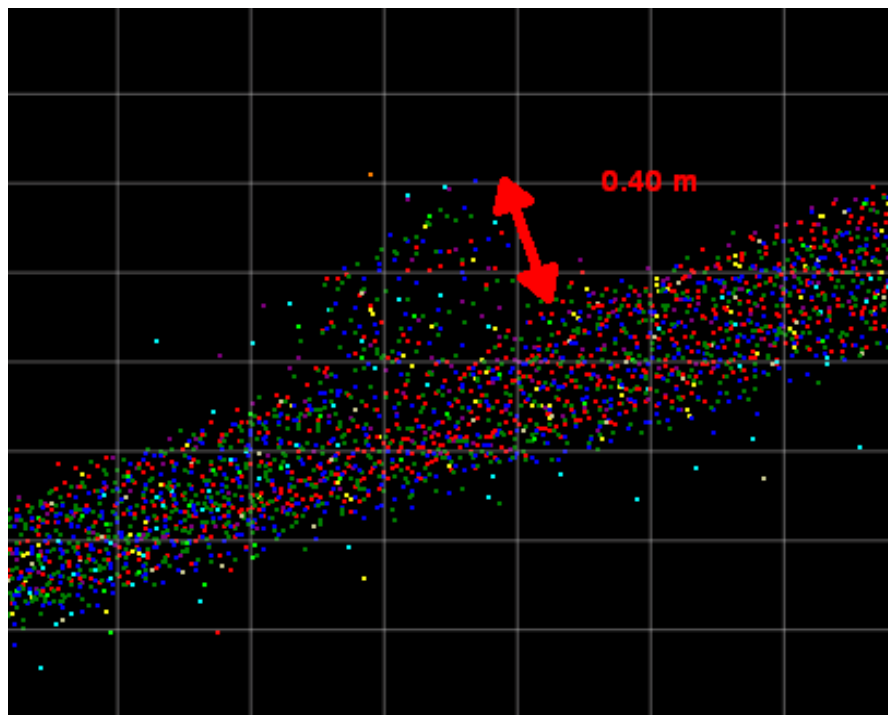


Figure 21: Charted (AWOIS 53-694) in CARIS Subset Editor-2D View ;(Exaggeration-5.0)

Additional Items

Four uncharted submerged piles were found in the bathymetry located off the southwest end of Marginal Pier in Womens Bay Harbor. See Figure 22. The uncharted submerged piles were detected with MBES, as illustrated in Figure 23, and surveyed to a least depth of 5.62 m (18.4 ft). The least depth on the shoalest submerged pile is designated in CARIS and is represented as submerged piles in the Field Verified hob file. The Hydrographer recommends charting “submerged piles” as per the digital data.²⁶

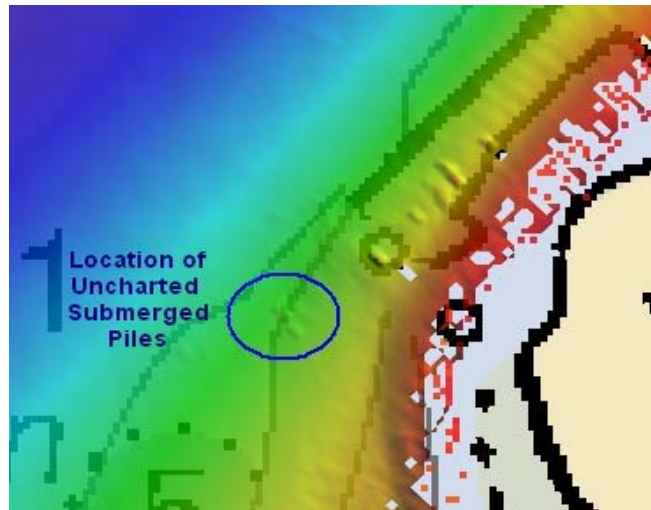


Figure 22: Uncharted submerged piles on CARIS BASE surface

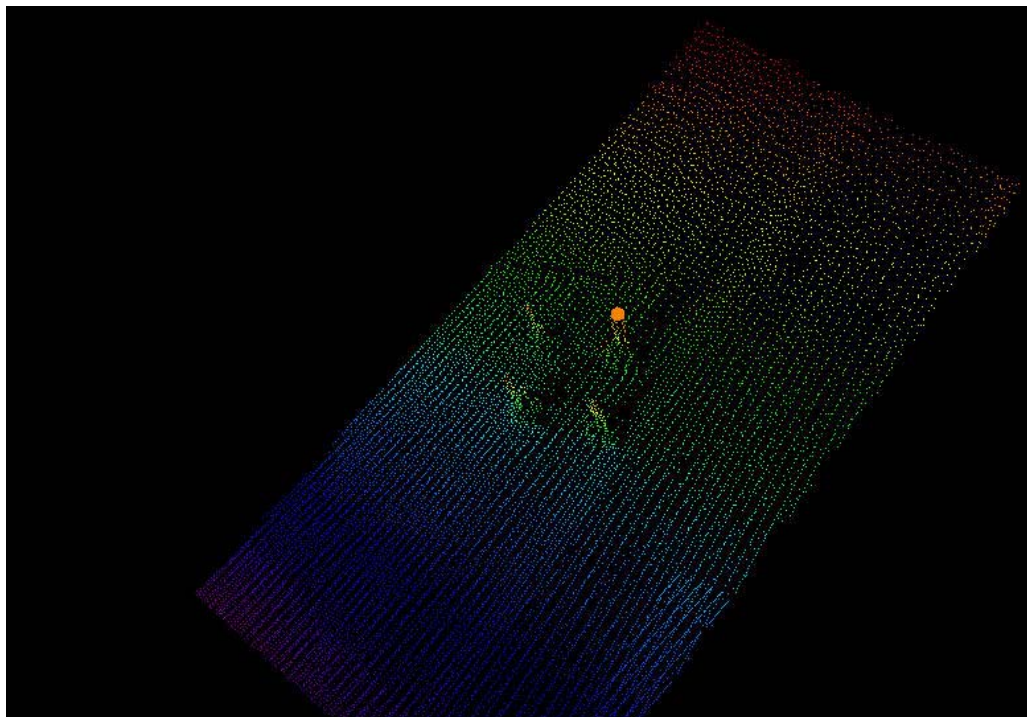


Figure 23: Uncharted piles in CARIS Subset Editor-3D View

A shoal was located south of the charted 21 foot sounding southwest of Marginal Pier in Womens Bay Harbor. (See Figure 24) This shoal area was detected with MBES, as depicted in Figure 25, and the least depth of 5.33 m (17.5) feet was designated in Caris. The Hydrographer recommends charting the shoal as per the digital sounding data.²⁷

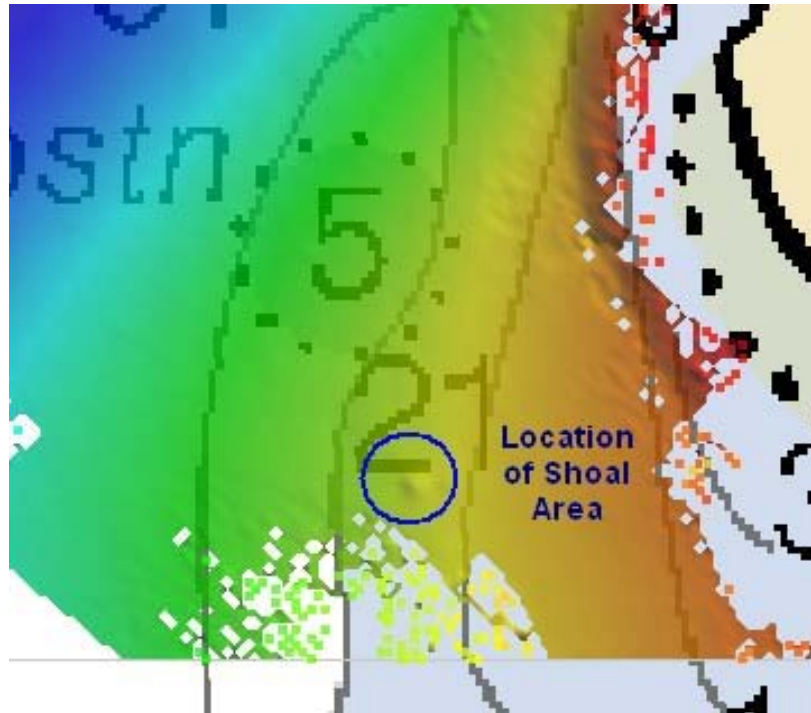


Figure 24: Shoal area depicted on CARIS BASE surface

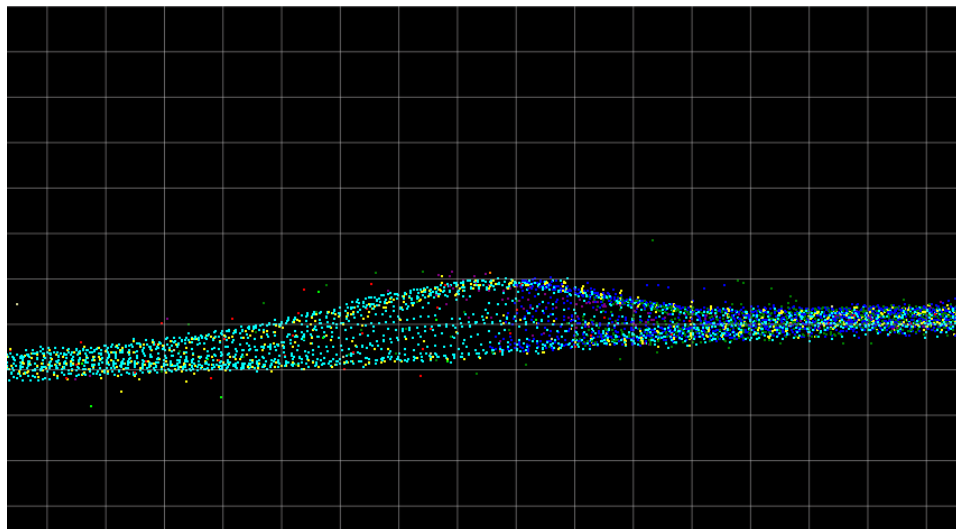


Figure 25: Shoal Area depicted in CARIS Subset Editor-2D View

Additional features investigated within the limits of F00558 are depicted on the Field verified hob file submitted with the digital data.²⁸

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed.²⁹

D.2.b. Shoreline Verification

Shoreline Source

Shoreline Verification was not required for this survey. The composite source provided with the project instructions was used as the source for comparisons with cultural features such as piers and obstructions.³⁰

Shoreline Verification

Although shoreline verification was not required for this survey, limited shoreline verification was conducted in accordance with the Specifications and Deliverables and FPM sections 6.1 and 6.2. Detached positions (DPs) acquired during shoreline verification were recorded in HYPACK, on DP forms, and processed in PYDRO. These indicate revisions to features and features not found on the verified shoreline.

All shoreline data is submitted in CARIS Notebook .hob files. The session F00558_Notebook contains the following:

HOB/SHP File	Purpose and Contents
F00558_CompSource.hob	Original Source Data as filtered from ENC cell 0_1FME01.000
F00558_Field_Verified.hob	Field verified source features and shoreline, including edits and updates not requiring DPs.
F00558_Disprovals.hob	Features needed to be removed from the chart.

Table 6: List and Description of Notebook HOB files.

The Field_Verified layer depicts features as noted in the field. The disprovals file contains all disproved or modified features.

Source Shoreline Changes and New Features

Items for survey F00558 that require further discussion and are associated with a detached position, have been flagged “Report” in PYDRO in F00558.pss. Investigation methods and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix I.³¹

The notebook session shows all shoreline updates, deletions and additions for survey F00558. All items that have a delete DP or GP have the associated ENC or FOID number of the deleted feature in the remarks field of the delete DP. Many delete DPs have multiple FOID numbers that represent multiple features.

Recommendations

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement shoreline information compiled on charts as described above.³²

D.2.c. Aids to Navigation

Eight (8) charted floating and static aids to navigation were within survey limits of F00558. All aids to navigation (ATONs) were visually verified to be correctly charted and serving their intended purpose.³³

D.2.d. Overhead Features

There are no overhead features within the limits of survey F00558.³⁴

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of F00558, and none were detected by the survey.³⁵

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey F00558, and none were observed to be operating in the area.³⁶

D.2.g. Bottom Samples

Bottom samples were not performed in survey F00558.³⁷

D.2.h. Other Findings

There are plans in the future for continued dredging in the survey area located in Womens Bay Harbor in order to harbor deep draft vessels.

D.2.i. Data Dissemination


A preliminary plot showing Digital Terrain maps (DTM) of Womens Bay and the approach channel was created on July 28 and it was delivered as a paper copy to CDR Anthony Stobbe, Kodiak facility Engineer. A digital preliminary sounding plot was sent via email to a number of US Coast Guard interested parties as well as the Alaskan Navigation Manager, LCDR David Zezula, on July 31; please see appendix V for correspondence. On August 18, *Rainier* provided a data CD including geo-referenced images and sounding data in xyz format to LCDR Zezula for dissemination to the Coast Guard to be used for engineering studies, not for navigation. Before disseminating the data above, *Rainier* received approval from Jeff Ferguson, Chief, Hydrographic Surveys Division.

E. APPROVAL

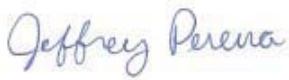
As Chief of Party, Field operations for hydrographic survey F00558 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual (April 2008 edition), Field Procedures Manual (May 2008 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through July 2008. These data are adequate to supersede charted data in their common areas. This survey is complete, with the exception of deficiencies noted in the Descriptive Report. 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, OPR-P136-RA-08	26 September 2008	N/CS34
Coast Pilot Report for OPR- P136-RA-08	TBD	N/CS26

Approved and Forwarded:  CAPT/NOAA
 Captain Donald W. Haines, NOAA
 Commanding Officer, NOAA Ship *Rainier* 2008.09.26 10:31:53 -07'00'

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

Survey Sheet Manager:  Digitally signed by Jeffrey Pereira
 DN: cn=Jeffrey Pereira, c=US, o=NOAA CORPS, ou=RAINIER,
 email=jeffrey.pereira@noaa.gov
 Reason: I am the author of this document
 Date: 2008.09.26 16:39:38 Z
 Jeffrey Pereira
 Ensign, NOAA

Chief Survey Technician:  I am signing this document for:
 2008.09.26 10:16:07 -07'00'
 James B. Jacobson
 Chief Survey Technician, NOAA Ship *Rainier*

Field Operations Officer:  I have reviewed this document
 2008.09.26 10:16:20 -07'00'
 Lieutenant Charles J. Yoos, NOAA
 Field Operations Officer, NOAA ship *Rainier*

-
- ¹ Concur.
- ² Filed with Project Reports.
- ³ Concur.
- ⁴ Concur.
- ⁵ Concur.
- ⁶ Concur.
- ⁷ Concur.
- ⁸ Concur.
- ⁹ During Office Survey Acceptance Review, the reviewer cleaned fliers out of the surface. The surfaces submitted by the field were recomputed and finalized. Fieldsheets “Channel” and “Womens_bay” contained the BASE surfaces used for compilation which were called 1m_Final_Office. The depth range on these surfaces were - 0.91m- 18.99m.
- ¹⁰ Appended to this document.
- ¹¹ Concur.
- ¹² Tide note has been appended to this document.
- ¹³ Chart 16596; 12th Edition dated 7/2002 of Local Notice to Mariners dated 8/21/2010 was used for chart comparison and compilation.
- ¹⁴ Concur.
- ¹⁵ Concur.
- ¹⁶ Concur.
- ¹⁷ Concur.
- ¹⁸ Concur.
- ¹⁹ Concur.
- ²⁰ Concur with clarification. Chart per F00558_CS.000.
- ²¹ Concur with clarification. Chart per F00558_CS.000.
- ²² Concur with clarification. Chart per F00558_CS.000.
- ²³ Concur.
- ²⁴ Concur.
- ²⁵ Concur.
- ²⁶ Concur with clarification. Chart per F00558_CS.000.
- ²⁷ Concur with clarification. Chart per F00558_CS.000.
- ²⁸ Filed with hydrographic records.
- ²⁹ Concur.
- ³⁰ Concur.
- ³¹ The Survey Feature Report is filed with the hydrographic records. Note: the survey feature report does not include all features from F00558. Additional features were added, some removed, and some modified in CARIS Notebook after the feature report was generated in Pydro. All features included in the compilation of F00558 have come directly from CARIS Notebook, which is the official features deliverable for this survey.
- ³² Concur with clarification. Shoreline depicted in Notebook HOB files was use in the compilation F00558_CS.000.
- ³³ Use the latest ATONIS listing.
- ³⁴ Concur.
- ³⁵ Concur.
- ³⁶ Concur.
- ³⁷ Concur.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 14, 2008

HYDROGRAPHIC BRANCH: Pacific Hydrographic Branch
HYDROGRAPHIC PROJECT: OPR-P136-RA-2008
HYDROGRAPHIC SHEET: F00558

LOCALITY: Women's Bay Approaches and Harbor, Kodiak Island, AK
TIME PERIOD: July 24 - 25, 2008

TIDE STATION USED: 945-7292 Kodiak Island, AK
Lat. 57° 43.8' N Long. 152° 30.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.397 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P136-RA-2008, F00558 during the time period between July 24 - 25, 2008.

Please use the zoning file "P136RA2008CORP" submitted with the project instructions for OPR-P136-RA-2008. Zones SWA107 and SWA108 are the applicable zones for F00558.

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).

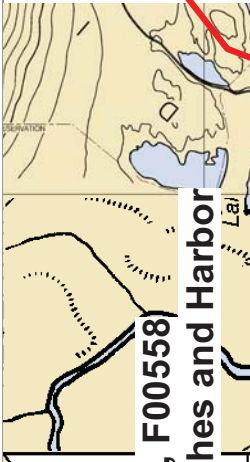
Note 2: Kodiak, AK (945-7292) was used for datum control in this hydrographic survey. Accepted datums for this station have been updated recently due to anomalous sea level trends. Therefore, the accepted datums at Kodiak, AK are based on a 2002-2006 update of Mean Sea Level (MSL). The tide ranges are still based on the 19 year 1983-2001 National Tidal Datum Epoch (NTDE) which are applied to the 5 year (2002-2006) Mean Sea Level (MSL), Mean Tide Level (MTL), and Diurnal Tide Level (DTL) to compute other tidal datums. The adoption of this procedure was necessary to ensure that these tidal datums accurately represent the existing stand of sea level for this area.

Peter J. Stone

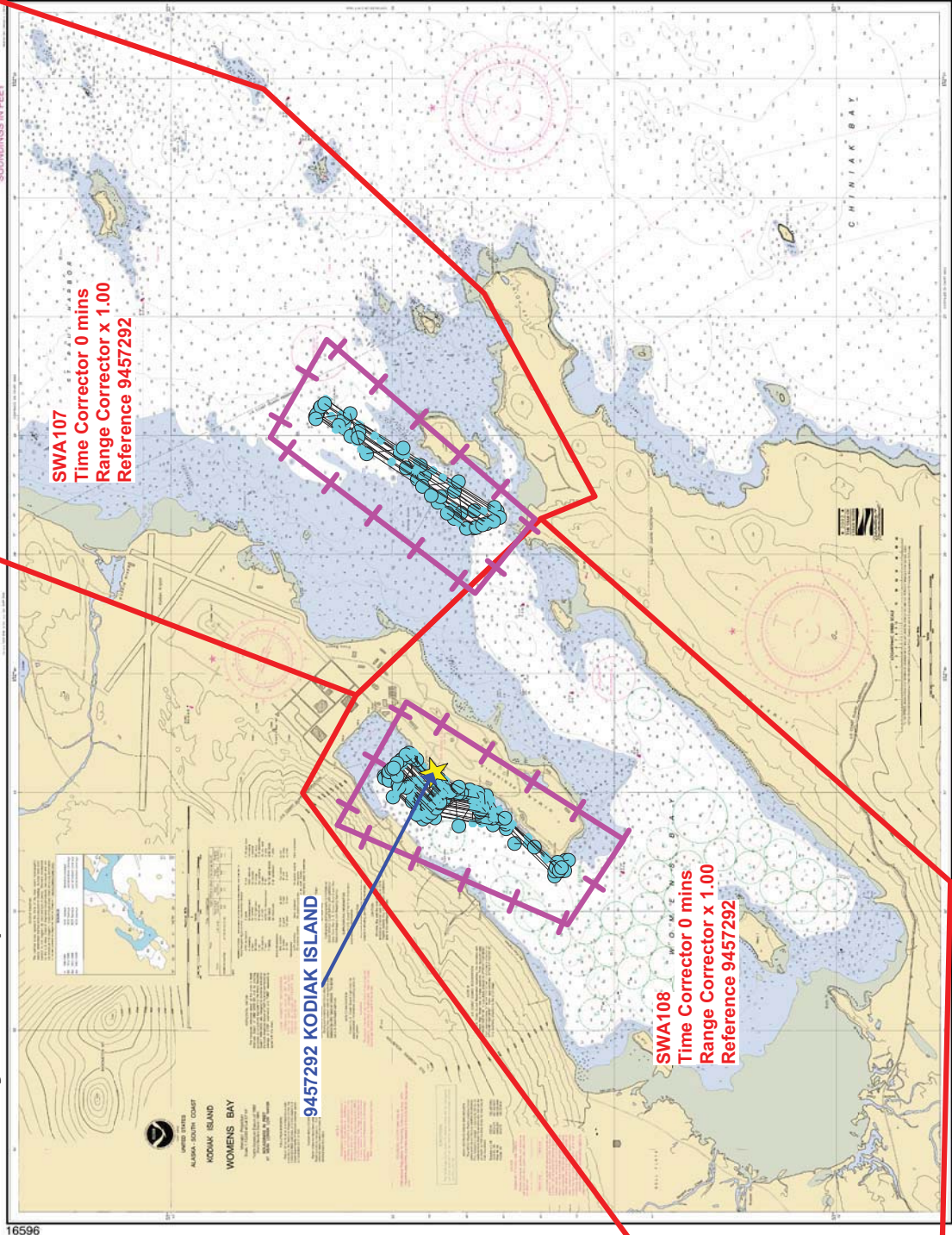
Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/
NOS, email=peter.stone@noaa.gov, c=US
Date: 2008.08.15 11:34:51 -04'00'

CHIEF, Oceanographic Division





Final Tidal Zoning for OPR-P136-RA-2008, F00558 Women's Bay Approaches and Harbor (Preliminary as Final)



SWA107
Time Corrector 0 mins
Range Corrector x 1.00
Reference 9457292

SWA108
Time Corrector 0 mins
Range Corrector x 1.00
Reference 9457292

9457292 KODIAK ISLAND

16596

SOUNDINGS IN FEET



From: "Cathleen Barry" <Cathleen.Barry@noaa.gov>
To: "FOO Rainier" <FOO.Rainier@noaa.gov>
Cc: "pete holmberg" <Peter.Holmberg@noaa.gov>; <Olivia.Hauser@noaa.gov>; "Kurt Brown" <Kurt.Brown@noaa.gov>; "foo fairweather" <FOO.Fairweather@noaa.gov>; "_NMAO MOA FOO Thomas Jefferson" <FOO.Thomas.Jefferson@noaa.gov>; "Mark Van Waes" <Mark.Vanwaes@noaa.gov>; "Eric M. Moore" <Eric.M.Moore@noaa.gov>; "Kathryn Simmons" <Kathryn.Simmons@noaa.gov>; "Matthew Jaskoski" <Matthew.Jaskoski@noaa.gov>; "Jack Riley" <Jack.Riley@noaa.gov>; "caryn arnold" <Caryn.Arnold@noaa.gov>
Sent: Sunday, April 27, 2008 1:11 PM
Subject: Re: Multibeam soundings on Cultural features

From an office processing, HCell compilation point of view this looks exactly right to me.

Cathleen

FOO Rainier wrote:

> Pete,
 >
 > Thanks for your reply. As someone who has compiled precisely zero
 > HCells, this is exactly the kind of feedback I was looking for.
 > With these comments, I will revise our 2008 game plan to the following:
 >
 > - We will not reject the "seafloor" anywhere. Clearly we will clean
 > out bad soundings to make the surface represent the seafloor, but we
 > will not worry about shoaler than 4m or shoaler than 0 m as a
 > criteria. Merely whether the data is modeling the seafloor. It
 > sounds like the H cell compiler will be able to "cut" out anything
 > beyond MLLW with relative ease.
 > - As Pete rightly emphasizes, we will not go inside the NALL line
 > trying for the 0 m curve, or spend a lot of time on the shoreline.
 >
 > - For cultural features (pilings, piers, buoy's and buoy chains,
 > etc.) that are above MLLW (i.e. negative sounding) AND on the field
 > verified .hob layer, we will reject the sounding data. The idea here
 > would be that we are reporting these features as features in the hob.
 > file and we don't want to pull up the BASE surface.
 > - For cultural features that are below MLLW, we will designate the
 > sounding (which the BASE surface will honor) AND include it on the
 > field verified .hob file.
 >
 > - For cultural features that are above MLLW and, for one reason or
 > another, are not on the field verified .hob file we will flag the
 > least depth as "outstanding," but not include it in the BASE surface
 > and reject all the other data. Hopefully, this would not occur
 > frequently - e.g. we have left the project area and are reviewing the
 > bathymetry and notice that we got a piling with negative soundings but
 > no corresponding DP or info from the comp source. In this case we
 > would use the "outstanding" sounding as a basis for creating a new
 > feature in the field verified .hob, but it won't affect the BASE

> surface. Jack - does that make sense? Can we bring in "outstanding"
 > soundings as features in Pydro? Am I missing anything here regarding
 > the meaning of "outstanding."
 >
 > - We will treat rocks as "seafloor." I.e. we will not reject data on
 > rocks or reefs or ledges, even above MLLW. We will continue to plan
 > on getting heights on rocks via "leveling" (aka eyeballing) during
 > traditional shoreline, but if we happen to get the least depth of a
 > rock, we will designate it and use that as the VALSOU in the
 > FieldVerified .hob. It doesn't sound like having the BASE surface
 > honor this will be a problem. (?) As before - we will not go trying
 > to get these data, but will not discard them if they are obtained. In
 > cases where the echosounder data do not get the least depth, we will
 > leave it in the surface and use the DP (or previously acquired comp
 > source data) for the feature.
 >
 > What do you think?
 > Thanks for your continued input,
 > Jake
 >
 > pete holmberg wrote:
 >> All,
 >>
 >> From the standpoint of an HCell compiler I welcome hydrographic data
 >> under the pier and negative depths. It actually makes my job much
 >> easier. Just so long as all pilings, and construction are cleaned
 >> out of the data.
 >> When compiling the HCell if I have data that comes right close to a
 >> pier but not quite, it leaves a sliver of unsurveyed area (that I can
 >> gloss over, but would rather not). It is highly unlikely that the
 >> field is going to be able to cut off the data right at the pier
 >> face. It is much easier for me to take the extents of a pier and put
 >> them over the data, then reject what ever overlapping hydro falls
 >> underneath the pier. This means I can portray complete coverage
 >> right up the edge.
 >>
 >> Concerning negative depths. Here are a few benefits to having this
 >> data. 1. I would much rather have the least depth on a rock via
 >> multibeam instead of "leveling"
 >> 2. No, I'm not going to chart negative depths, but I would be more
 >> than happy to chart a new MLLW (0 depth curve). It is extremely
 >> difficult to allign new accurate data with outdated and an often
 >> inaccurate charted MLLW line.
 >> 3. I am much more confident in removing charted rocks when they are
 >> fully covered with multibeam as opposed to investigated with a
 >> singlebeam, or half covered.
 >>
 >> Although I want to state that I no way what so ever would ask the
 >> field units to take their vessels inside the NALL unless they feel it
 >> necessary. But if we can safely aquire accurate data up to shore why
 >> would we turn that down!? I cannot emphasize how much easier it is

>> to compile a survey when you have data that covers shore to shore.
>> Not having to deal with the little strip between the edge of the
>> survey and the charted shoreline that is peppered with bits of info
>> via DPs, GPs, and digitized features.
>>
>> I say this with experience as I have compiled an HCell from SWMB and
>> LIDAR combined and it was great to be able to chart all the way into
>> shore. The only problem was that I had to retain some charted rocks
>> as LIDAR is not robust enough to disprove rocks. If I had SWMB all
>> the way in I would be able to clean out so much of the generalized
>> and mispositioned clutter along the shore.
>>
>> Pete
>>
>>
>>
>> Olivia.Hauser@noaa.gov wrote:
>>> *
>>>
>>> Hello All,
>>>
>>> *I know you are going to roll your eyes and grr at the computer
>>> screen about this, but I figure I should say it anyway. The FMWG,
>>> HSD and such is going to argue that we should not be spending time
>>> examining or charting anything shallower than the 4 meter curve. I
>>> realize that depths around a pier are navigationally significant and
>>> should be evaluated, but depths under the pier are not significant
>>> and should not be evaluated. (Delete, don't dither!) I also think
>>> that it will only create issues later when creating an H-cell. How
>>> can you have depths and an above water feature represented in the
>>> same place on a chart? (That was not to much of a repeat of what
>>> Kurt said, I hope) To address the obstruction question, as far as I
>>> know, submerged obstructions are included in the bathygrid, but
>>> features that are above water are removed from the grid. You bring
>>> up an excellent question. When does a feature switch from being in
>>> the grid to out of the grid? I guess that's a FMWG question, with
>>> heavy weigh-in from the processing branches. No more from me. Have a
>>> good weekend.*
>>>
>>> *** Olivia*
>>>
>>> ----- Original Message -----* *From*: Kurt Brown
>>> <Kurt.Brown@noaa.gov> *Date*: Thursday, April 24, 2008 6:35 pm
>>> *Subject*: Re: Multibeam soundings on Cultural features > Hi Jake,
>>> >
>>> > Good questions! I spoke with Pete about this and from the
>>> > cartographic
>>> > side it would be best if you reject all the sounding data on the
>>> > pier
>>> > pilings as they tend to pull up the combined BASE surface at the
>>> > edge of

>>> > the pier and give the impression of shoaling along the pier face
 >>> > which
 >>> > could be interpreted as actual shoaling and charted as such. You
 >>> > can
 >>> > keep the sounding data in between the pilings underneath the pier
 >>> > as it
 >>> > is useful to the cartographers during compilation but can be cut
 >>> > out
 >>> > before the H-Cell is submitted to MCD.
 >>> >
 >>> > If you get the least depth on a pile with the tilted system and it
 >>> > is
 >>> > above water you could use the negative depth as a height for the
 >>> > feature
 >>> > (created as a GP at that position) and then reject the data. I
 >>> > think a
 >>> > DP on a pile that is always dry and the pile baring at low water
 >>> > is the
 >>> > best way to deal with those features and the multibeam data on
 >>> > them
 >>> > should also be rejected.
 >>> >
 >>> > I would also speak with Cathleen as she can probably give you more
 >>> > guidance.
 >>> > Kurt
 >>> >
 >>> >
 >>> >
 >>> > FOO Rainier wrote:
 >>> > > Good afternoon (by the time the ship mail gets off) all,
 >>> > >
 >>> > > Today, my thoughts turn to the issue of bathymetric data on
 >>> > > cultural
 >>> > > features. We've all been there - you survey inside a harbor,
 >>> > > you want
 >>> > > to get full coverage, so you survey right up to the pier face,
 >>> > > and in
 >>> > > doing so you collect lots of really good quality MBES across the
 >>> > > pilings and pier face. Then you say to yourself: self, what
 >>> > > the heck
 >>> > > do I do with these soundings.
 >>> > >
 >>> > > I think current practice across the fleet is to reject these
 >>> > > soundings
 >>> > > (foos? NRTs?). That has been my experience, simply because you
 >>> > > do not
 >>> > > want those soundings to appear in your BASE surface. However -
 >>> > > they
 >>> > > are good data and they correlate with the features (ooh - that
 >>> > > word)
 >>> > > that you collected. So rejecting them doesn't necessarily seem

>>> > right. There is actually a correlated problem too - what about
 >>> > the
 >>> > data that is representing the seafloor, but is directly below
 >>> > the pier
 >>> > overhang? Typically, the sea floor dramatically comes up at the
 >>> > pier
 >>> > face, seaward of the pilings, but shoreward of the actual pier.
 >>> > Are
 >>> > you rejecting those data as well? I know Kathryn has a good
 >>> > story
 >>> > about rocks sliding from underneath the pier face - possibly
 >>> > good
 >>> > reason not to be rejecting data.
 >>> > Once, while I was on BH, we tried flagging all the piling
 >>> > soundings as
 >>> > "examined" and creating our surfaces with the include examined
 >>> > soundings UNchecked. That way the data were retained as real,
 >>> > but not
 >>> > submitted with our BASE surfaces. It also allowed us to create
 >>> > surfaces with the piers if we wanted to look at them. However,
 >>> > "examined" (the same is true for "outstanding") soundings end up
 >>> > in
 >>> > the critical soundings layer in Caris, which is a huge hassle,
 >>> > since
 >>> > typically you have hundreds of these things. By experimenting,
 >>> > it
 >>> > appears that Pydro imports as features "designated and
 >>> > "outstanding"
 >>> > soundings, but not "examined". Jack - is that right?
 >>> >
 >>> > It would be nice to correlate the bathy in pydro - so maybe we
 >>> > could
 >>> > mark as "outstanding" the top sounding of the piling or corners
 >>> > of the
 >>> > pier and reject all else?
 >>> >
 >>> > Further thoughts on this issue: when does a pier become a
 >>> > piling
 >>> > become a obstruction. I.e. I think we all agree that we should
 >>> > reject (or at least not include) data from a pier face in our
 >>> > submission surfaces. But I would certainly include a submerged
 >>> > pile
 >>> > in the BASE surface. What about a pile that bares at low water?
 >>> >
 >>> > Should it be in the BASE surface? (What if by using the PDBS or
 >>> > a
 >>> > tilted MBES we got the least depth on it with bathy, even
 >>> > thought the
 >>> > least depth is above MLLW?) What about a single pile in the
 >>> > middle of
 >>> > the sheet that is always showing - do we reject that and chart

>>> > as per
>>> > > DP? Do we keep it and chart as DP? Should it be represented in
>>> > the
>>> > > BASE surface? I know this quickly goes down the rabbit hole of
>>> > "what
>>> > > is a feature?" but I am curious what you all are doing. I
>>> > suppose at
>>> > > some point this is worth kicking up to the FMWG - but I wanted
>>> > to seek
>>> > > your advice before we raise it to that level.
>>> > >
>>> > > Kurt, I ostensibly wrote this email to you - how will these
>>> > issues
>>> > > affect the branch? Do you have a preference as to what we do
>>> > with these?
>>> > >
>>> > > Thanks everybody,
>>> > > Jake
>>> > >
>>> > >
>>> > >
>>> > >
>>> >

F00558 HCell Report
Tyanne Faulkes, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey F00558 used:

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

2. Compilation Scale

Depths and features for HCell F00558 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16596	1:10,000	12 th	7/2002	8/21/2010

The following ENC's were also used during compilation:

Chart	Scale
US5AKDM	1:10,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 1-meter finalized surfaces in CARIS BASE Editor. A shoal-biased selection was made at 1: 2,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
-4.7	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 (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 Feet from Chart 16596	Metric Equivalent to Chart Feet, Arithmetically Rounded	Metric Equivalent of Chart Feet, with NOAA Rounding Applied	Feet with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on F00588_SS.000
0	0	0.2286	0.750	0
6	1.8288	2.0574	6.750	6
12	3.6576	3.8862	12.750	12
18	5.4864	5.715	18.750	18
24	7.3152	7.5438	24.750	24
30	9.144	9.3726	30.750	30
60	18.288	18.5166	60.750	60

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 F00558:

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
CAUSWY	Causeways
DEPCNT	Modified GC MLLW
MORFAC	Dolphins
M_QUAL	Data quality Meta object
OBSTRN	Obstruction area object
PILPNT	Piles
SBDARE	Bottom samples
SLCONS	Piers
SOUNDG	Soundings at the chart scale density

The *_SS HCell contains the following Objects:

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

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

Depth Units (DUNI):	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

F00558 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

F00558_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:10,000
F00558_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1: 2,000
F00558_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
F00558_outline.gml	Survey outline
F00558_outline.xsd	Survey outline

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:

Tyanne Faulkes
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206.526.4761
Tyanne.Faulkes@noaa.gov

APPROVAL SHEET
F00558

Initial Approvals:

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

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

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