H12176

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. H12176

LOCALITY

State Alaska

General Locality Behm Canal

Sublocality Alava Bay to Mouth of Smeaton Bay

2010

CHIEF OF PARTY

Captain David O. Neander, NOAA

LIBRARY & ARCHIVES

DATE

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

HYDROGRAPHIC TITLE SHEET

REGISTRY No

H12176

INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD No: N/A

State **Alaska**

General Locality **Behm Canal**

Sub-Locality **Alava Bay to Mouth of Smeaton Bay**

Scale **1:40,000** Date of Survey **May 9-24, 2010**

Instructions dated **2/16/2010** Project No. **OPR-O193-FA-10**

Vessel **NOAA Ship Fairweather**

Chief of party **Captain David O. Neander, NOAA**

Surveyed by **Fairweather Personnel**

Soundings by **Reson 7125sv MBES, and Reson 8160 MBES**

SAR by **Andrew Clos** Compilation by **Peter Holmberg**

Soundings compiled in **Fathoms**

REMARKS: **All times are UTC. UTM Zone 08**

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were generated during office processing. Page numbering may be interrupted or non sequential.

All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

Descriptive Report to Accompany Hydrographic Survey H12176

Project OPR-O193-FA-10
Behm Canal, Alaska
Scale 1:40,000
May 2010
NOAA Ship *Fairweather*
Chief of Party: Captain David O. Neander, NOAA

A. AREA SURVEYED

The survey area consists of approximately 30 square nautical miles of Behm Canal, Alaska from Alava Bay to the mouth of Smeaton Bay (Figure 1). This survey corresponds to sheet identification number 4 in the registery details as provided in the Project Instructions dated February 16, 2010.

Data acquisition was conducted from May 9 to May 24, 2010 (DN 129 to DN 144).

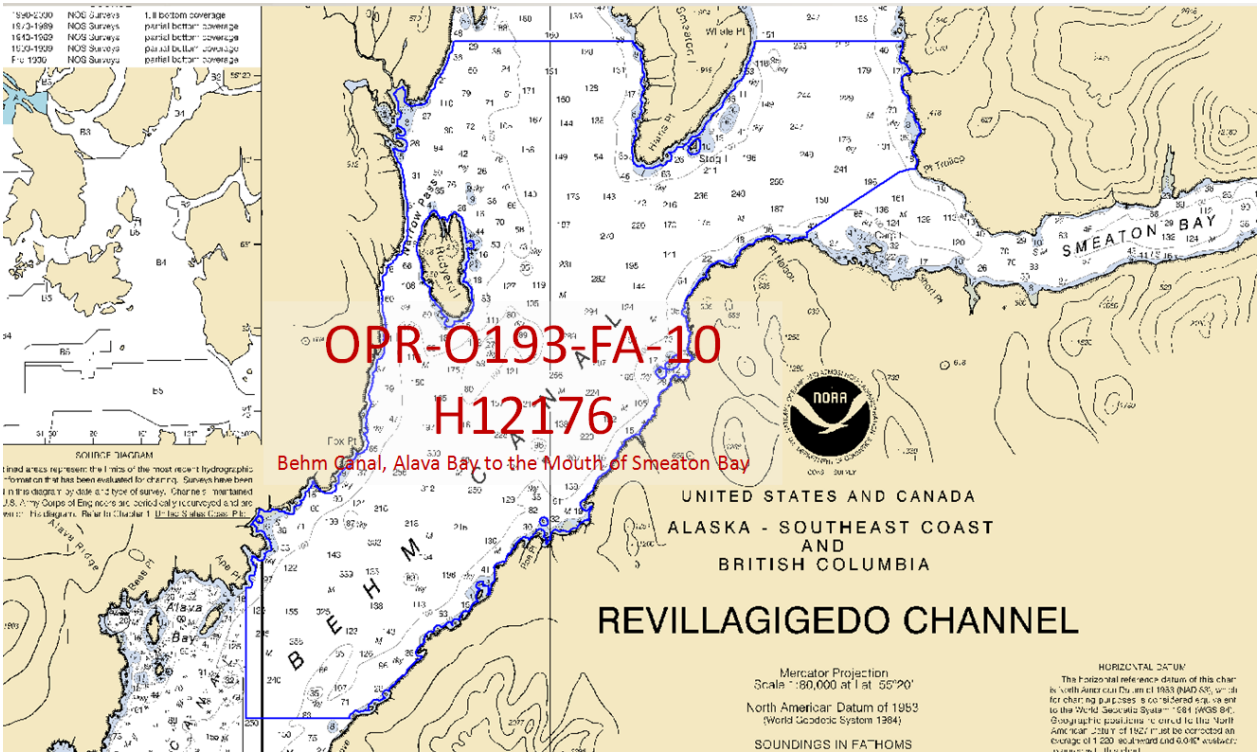


Figure 1: H12176 Survey Outline

Complete multibeam echosounder (MBES) coverage was obtained to the navigable area limit line (NALL) as defined in section 1.1.2 of the Hydrographic Survey Specifications and Deliverable, April 2010 (HSSD).

Limited shoreline verification was conducted to determine the inshore limit of hydrography and for feature verification, as per section 3.5.5.3 of the Field Procedures Manual, April 2010 (FPM). Shoreline features were given S-57 attribution and included for submission in the CARIS notebook file H12176_FINAL_FEATURE_FILE.hob.

Mainscheme and crossline mileage for MBES and shoreline acquisition displayed in Table 1.

MAIN SCHEME - Mileage	
0	**Single Beam MS**
259.34	**Multibeam MS mileage**
63.31	FAIRWEATHER S-220
33.72	Launch 2805
90.56	Launch 2806
20.01	Launch 2807
51.73	Launch 2808
0	**SideScan MS**
259.34	**Total MS**
CROSSLINE - Mileage	
0	**Single Beam XL**
24.35	**Multibeam XL**
1.88	FAIRWEATHER S-220
6.66	Launch 2805
0.00	Launch 2806
0.00	Launch 2807
15.81	Launch 2808
24.35	**Total XL**
OTHER	
0	**Developments/AWOIS - Mileage**
1.16	**Shoreline/Nearshore Investigation - Mileage**
8	**Total # of Investigated Items**
7	**Total Bottom Samples**
30.43	**Total SNM**
5/9, 5/10, 5/11, 5/19, 5/21, 5/22, 5/24	**Specific Dates of Acquisition**
129, 130, 131, 139, 140, 141, 142, 144	**Specific Dn#s of Acquisition**

Table 1: H12176 Survey Statistics

B. DATA ACQUISTION AND PROCESSING

A complete description of data acquisition, processing systems and survey vessels along with quality control procedures and data processing methods are included and described in the *NOAA Ship Fairweather 2010 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. This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-O193-FA-10, dated Feb 16, 2010 and, Change No.1, dated Apr, 23 2010.

B.1 Equipment and Vessels

Equipment and vessels used for data acquisition and survey operations during this survey are listed below in Table 1.

	FAIRWEATHER S220	Launch 2805	Launch 2806	Launch 2807	Launch 2808	Ambar 2302	Skiff 1905
Hull Registration Number	S220	2805	2806	2807	2808	2302	1905
Builder	Aerojet-General Shipyard	All American	All American	All American	All American	Marine Silverships, Inc	SeaArk Marine, Inc
Length Overall	231 feet	28' 10"	28' 10"	28' 10"	28' 10"	23'	19'
Beam	42 feet	10' 8"	10' 8"	10' 8"	10' 8"	9' 4"	8'
Draft, Maximum	15' 6"	4' 0" DWL	4' 0" DWL	4' 0" DWL	4' 0" DWL	1' 4"	1' 10"
Cruising Speed	12.5 knots	28 knots	28 knots	28 knots	28 knots	22 knots	29 Knots
Max Survey Speed	8 knots	8 knots	8 knots	8 knots	8 knots		
Primary Echo-sounder(s)	RESON 8160	RESON 7125	RESON 7125	RESON 7125	RESON 7125		
Sound Velocity Equipment	MVP 200 SVP70	SBE19plus SVP71	SBE19plus SVP71	SBE19plus SVP71	SBE19plus SVP71		
Attitude & Positioning Equipment	POS/MV V4	POS/MV V4	POS/MV V4	POS/MV V4	POS/MV V4		
Type of operation	MBES	MBES	MBES	MBES	MBES	Shoreline, Base Station/Tide gauge	Base Station/ Tide gauge

Table 2: Vessel Inventory

No vessel configurations used during data acquisition deviated from the DAPR.

B.2 Quality Control

Data collected by all platforms, and at all frequencies exhibited good argreement throuout the survey area (Figures 2 & 3). Data coverage and density requirements were met; and no systematic, sound velocity or tidal errors were noted in the data. One SVP file was incorrectly positioned: for launch 2808 on DN 131 profile 221549 was incorrectly attributed with longitude 131°58’14”W. This was changed in CARIS SVP editor to the correct position of longitude 130°58’14”W.

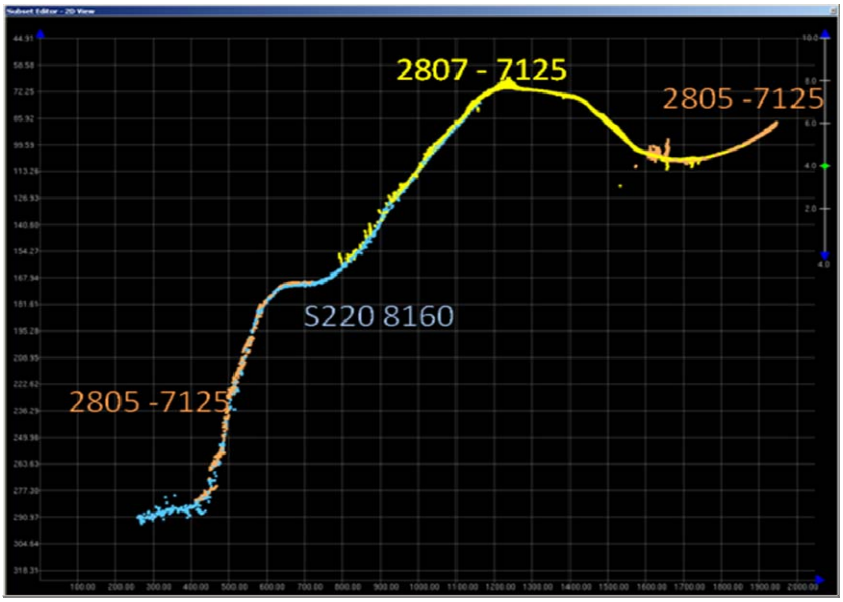


Figure 2: Sounding agreement between platforms

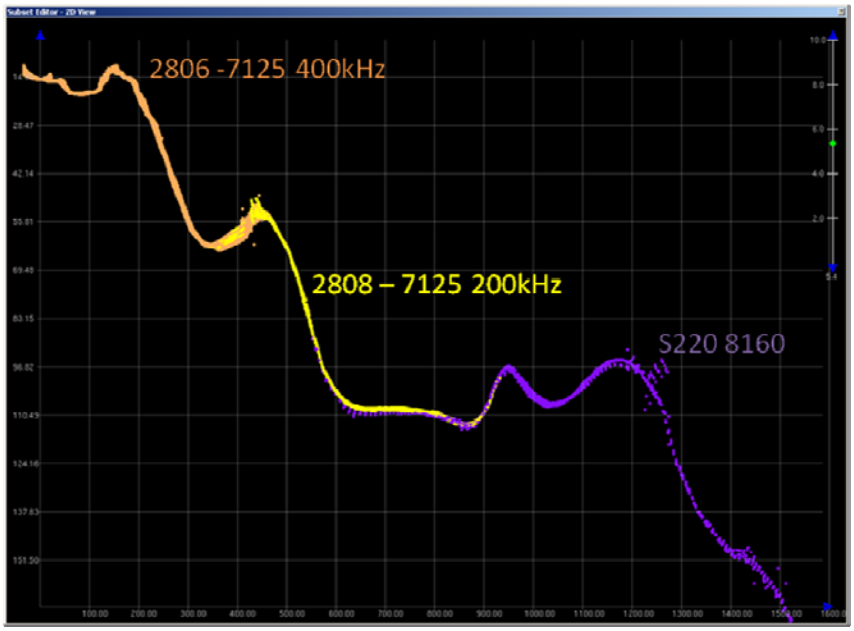


Figure 3: Sounding agreement between platforms and frequencies

B.2.1 Crosslines

Multibeam crosslines for this survey totaled 24.35 linear nautical miles (LNM), comprising 9.4% of the 259.34 LNM of mainscheme MBES hydrography. Both main scheme and crossline mileage are summarized in Table 1 above.

All crosslines were filtered to 45 degrees from nadir. Surface differencing in CARIS BathyDataBASE was used to assess crossline agreement with mainscheme lines. Figure 5 depicts a difference surface between a 32-meter surface made with mainscheme lines only and a 32-meter surface made with crosslines only. Differences were greatest in deeper areas particularly between Reson 8160 (50 kHZ) and Reson 7125 (200 kHZ) data, as well as at outer beams. However, surfaces agreed within IHO specifications.[1] This difference surface is submitted digitally in the Separates IV folder. Crosslines agree with main scheme lines within the total allowable vertical and horiztal uncertainty in their common areas.[2]

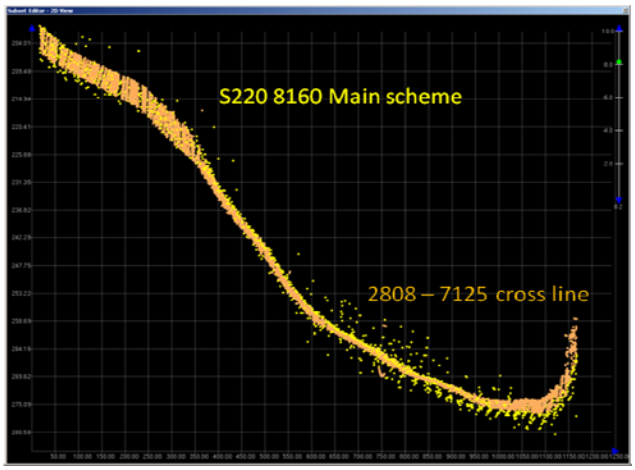


Figure 4: Agreement between crossline and main scheme lines

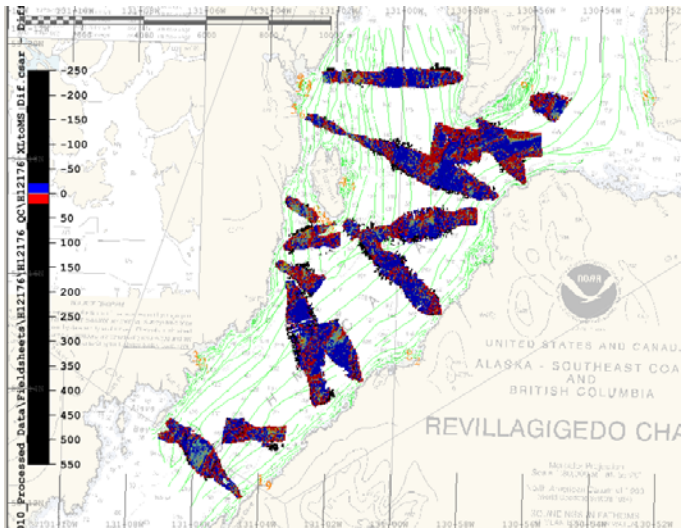


Figure 5: Crossline and main scheme differences (white indicates agreement, warm colors indicate a XLs shallower than mainscheme and cool colors indicate XLs are deeper).

B.2.2 Junctions

Survey H12176 junctions with contemporary surveys H12177 (1:20000, May 2010) and H12175 (1:40000, May 2010), sheets 3 and 5 respectively of OPR-O193-FA-10. The area of overlap between the sheets was reviewed in CARIS Subset Editor for consistency and data were found to be in agreement within the total allowable vertical and horiztal uncertainty in their common areas. Vertical agreement is typically less than 0.5 meters**.** The sheet limits and area of overlap for H12175 and H12177 are shown in Figure 6.[3]

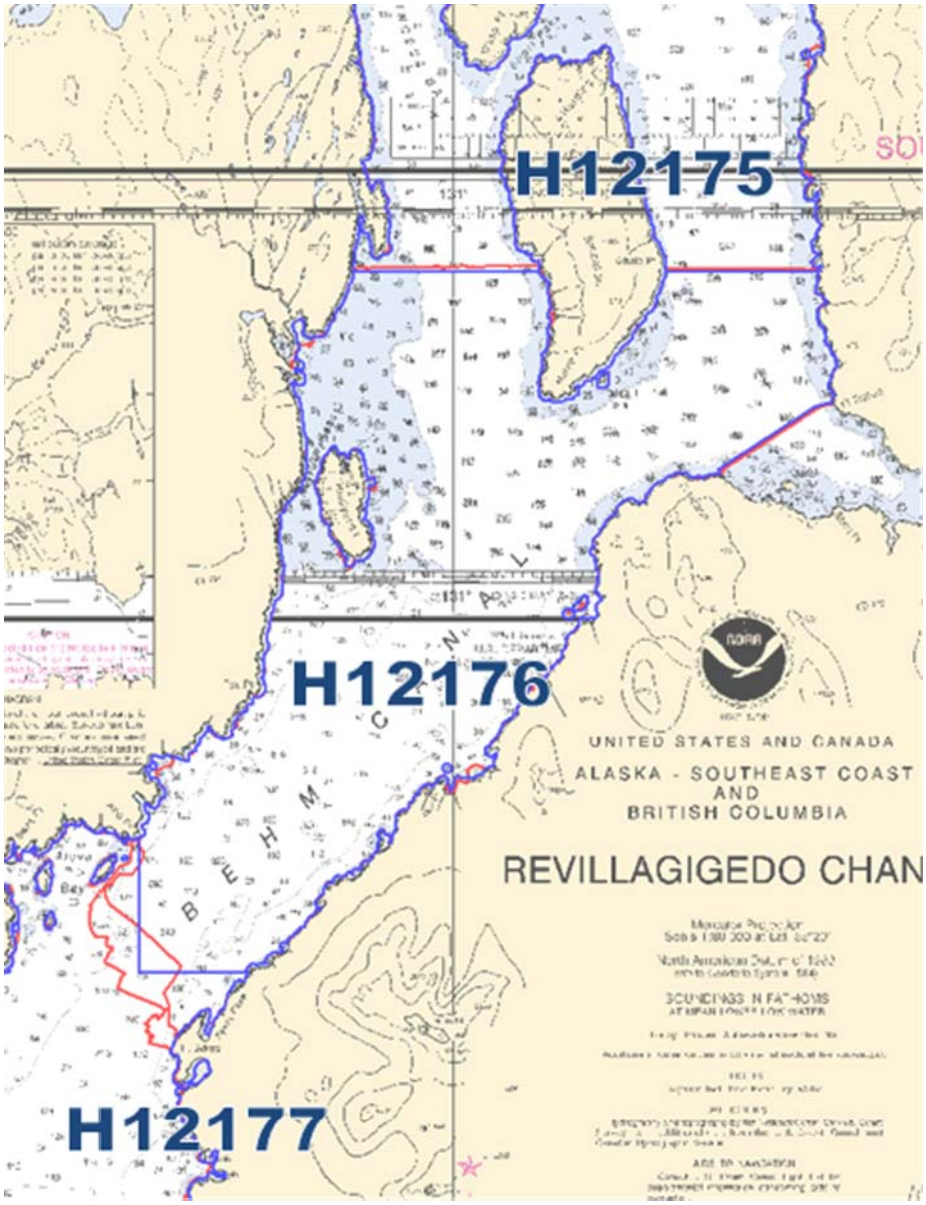


Figure 6: Overview of H12176 junction areas with contemporary surveys H12175 and H12177. Blue lines show sheet limits, red lines show final survey outlines and areas of overlap.

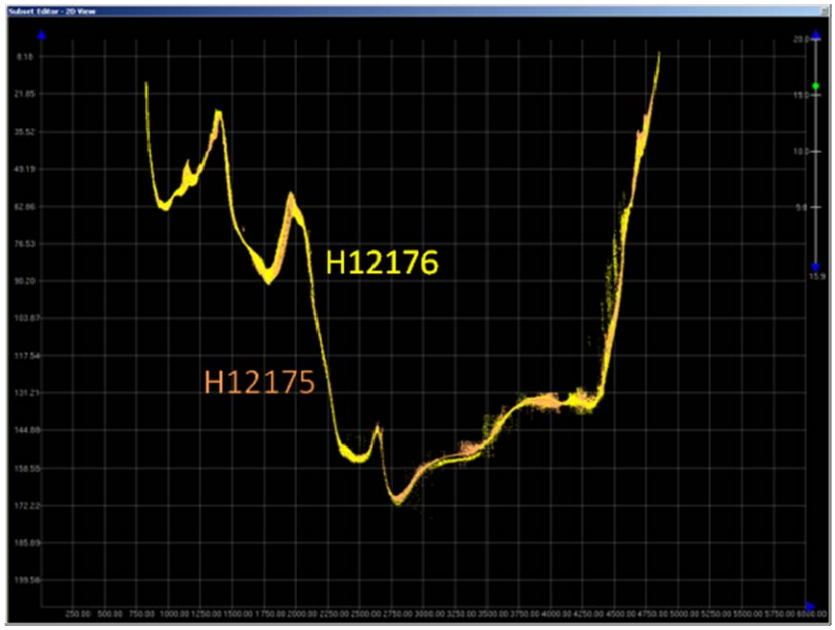


Figure 7: Cross-section view of H12176 example junction area with contemporary surveys H12175

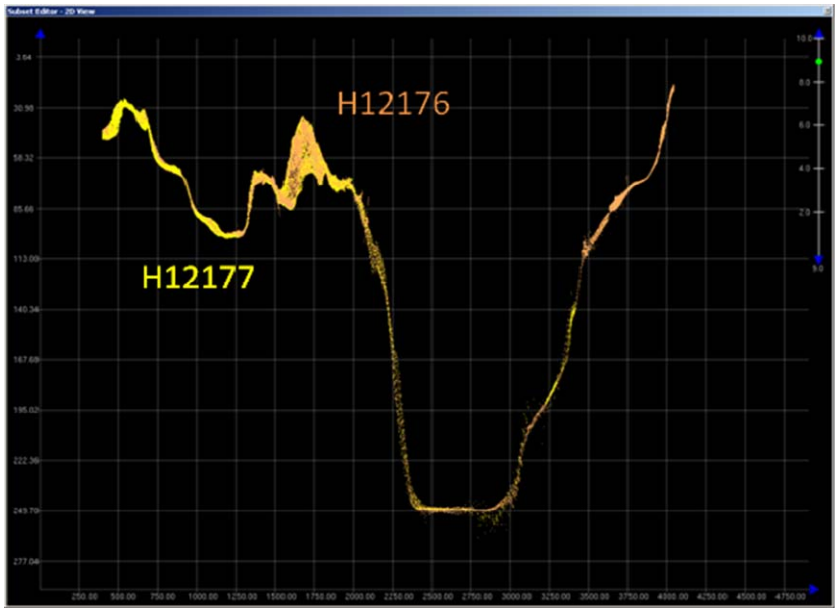


Figure 8: Cross-section view of H12176 junction area with contemporary surveys H12177

B.2.3 Quality Control Checks

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

B.2.4 Data Quality Factors

COVERAGE ASSESSMENT

Complete multibeam coverage was obtained within the limits of H12176. Coverage gaps exist in some steep areas due to decreased ping rates associated with higher range settings used during acquisition (Figure 9). Acoustic shadowing on the down-slope side of some features also caused some gaps in coverage (Figure 10). However, the least depths of all navigationally significant features that could be safely obtained by field personnel are represented by H12176. Coverage gaps spanning more than three nodes were noted in areas where surveyed depths are greater than 30 meters. These gaps, however, were deemed by the Hydrographer not to violate coverage requirements. A coverage gap of approximately 60 meters in length exists over a charted rock located east of Smeaton Island (Figure 11) due to time, weather and tide constraints a least depth on this feature could not be safely obtained by field personnel. Similarly, a coverage gap of approximately 20 meters in length exists near a charted 8 fathom shoal (Figure 12). The coverage gap is approximately 80 meters south of the shoal and is located in surveyed depths of approximately 30 meters. Owing to the close proximity of this coverage gap to the more navigationally significant shoal, no further development was conducted by field personnel.[4]

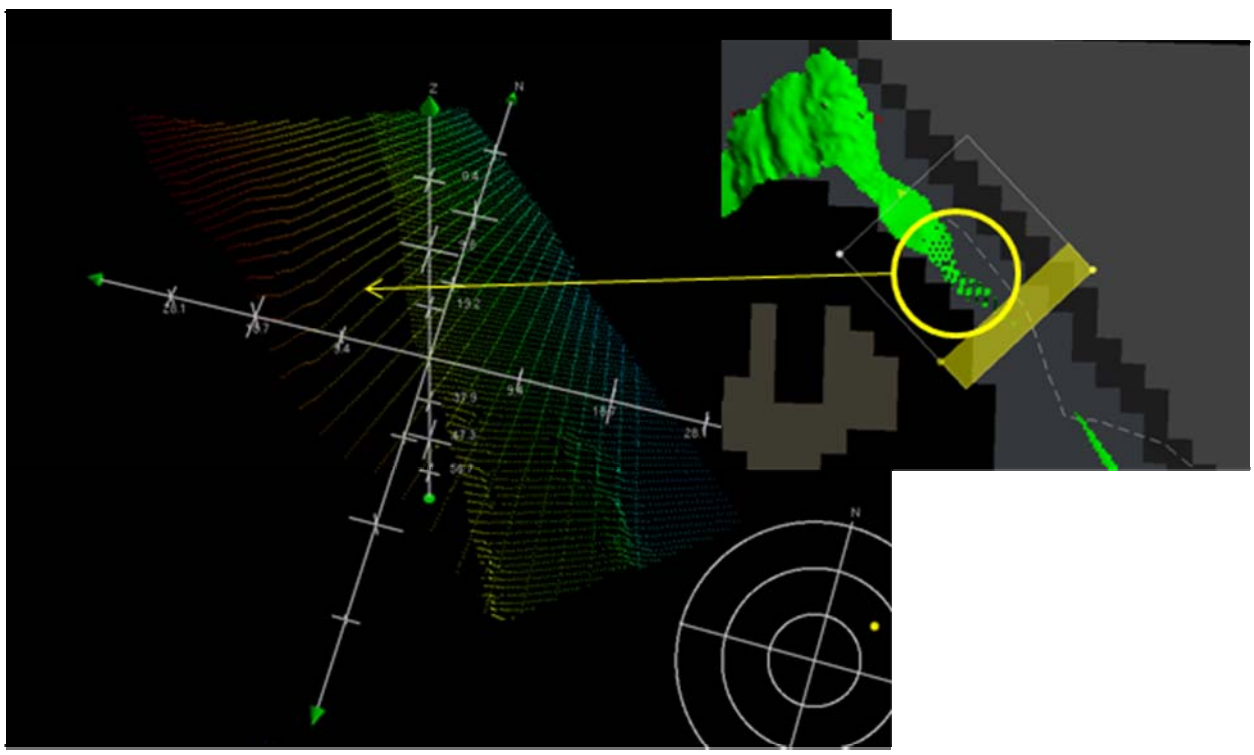


Figure 9: Coverage gaps in steep area caused by increased range scale & decreased ping rates.

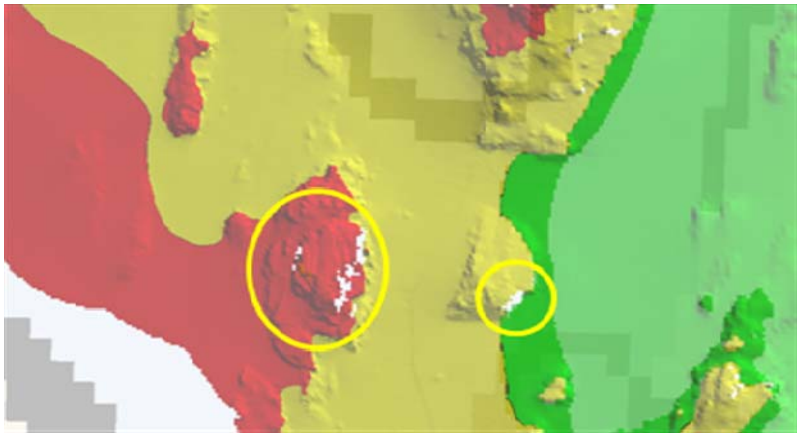


Figure 10: Coverage gaps on the down-slope side of features caused by acoustic shadow.

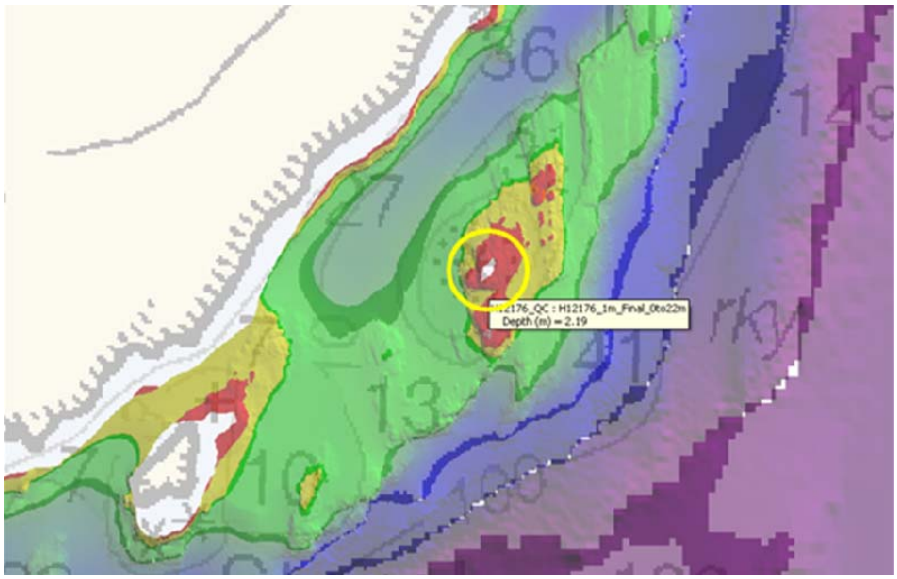


Figure 11: Coverage gap over charted rock (17424 & 17434).

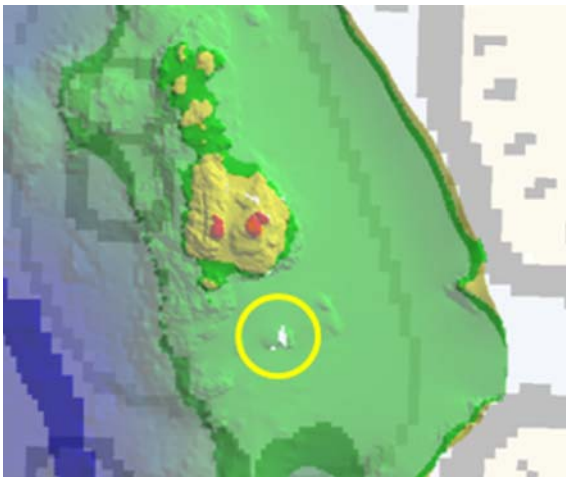


Figure 12: Coverage gap near charted 8 fathom shoal (17424 & 17434).

DENSITY
Density requirements for H12176 were achieved with at least 95% of finalized surface nodes containing five or more soundings (see Appendix V).

POSITIONING:
Smoothed Best Estimated Trajectory (SBET) and associated error (RMS) data were applied to all soundings within the limits of H12176.

TRUEHEAVE:
To enable the application of TrueHeave some POS/MV TrueHeave files were "fixed" using the *fixTrueHeave.exe* utility from CARIS. Fixed files were assigned an additional *.fixed suffix. This was performed for Launch 2806 on days 131 and 139 and for Launch 2808 on day 129.

.
DESIGNATED SOUNDINGS
Designation of soundings followed procedures as outlined in section 5.1.1.3 of the HSSD dated April 2010. A total of six soundings were designated within the limits of H12176. Soundings were designated to ensure fidelity of Combined Uncertainty and Bathymetry Estimator (CUBE) surfaces to the least depths of navigationally significant objects.[5]

UNUSUAL CONDITIONS
Due to the general bathymetry of the survey area, i.e. a steep walled glacial fiord, MBES data exhibited substantial down-slope noise and data blowouts. As a result of these spurious data extensive cleaning was performed in CARIS subset editor.

B.2.5 Accuracy Standards

All data meet the data accuracy specifications as stated in the HSSD.[6]

B.3 Corrections to Echo Soundings

Data reduction procedures for survey H12176 conform to those detailed in the DAPR.

B.4 Data Processing

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final tide and sound velocity application is noted in the H12176_Data_Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

Data processing procedures for survey H12176 conform to those detailed in the DAPR. Data were processed initially using CARIS HIPS & SIPS v7.0, Service Pack 1, and Hotfix 5, Notebook v3.1 Hotfix 2, and BathyDatabase v2.3 in conjunction with version 2 of the NOAA object catalog support files. Surfaces were also created and final cleaning was done using CARIS HIPS & SIPS v7.0 Service Pack 2. 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 Total Propagated Uncertainty (TPU) in CARIS for H12176 are listed in Table 4.

TPU values used for data collected by launches; 2805, 2806, 2807 & 2808.				
Tide values:	Measured	0.01 m	Zoning	0.10 m
Sound Speed Values:	Measured	1.00 m/s	Surface	0.50 m/s

TPU values used for data collected by *Fairweather* S220.				
Tide values:	Measured	0.01 m	Zoning	0.10 m
Sound Speed Values:	Measured	0.50 m/s	Surface	0.50 m/s

Table 4: Survey Specific CARIS TPU Parameters

CUBE SURFACES:
The CARIS HIPS BASE (Bathymetry Associated with Statistical Error) surfaces delivered with H12176 and their associated resolutions are listed in Table 5. The NOAA CUBE parameters file *CUBEParams_2010.xml* was used for the creation of all CUBE BASE surfaces in Survey H12176.

Fieldsheet Name	Surface Name	Depth Ranges (m)	Resolution (m)
H12176_QC	H12176 _1m	All	1
	H12176_2m	All	2
	H12176_4m	All	4
	H12176_8m	All	8
	H12176_16m	All	16
	H12176_32m	All	32
	H12176_1m_Final_0to22	0-22	1
	H12176_2m_Final_20to44	20-44	2
	H12176_4m_Final_40to88	40-88	4
	H12176_8m_Final_80to176	80-176	8
	H12176_16m_Final_160to352m	160-352	16
	H12176_32m_Final_320to640m	320-640	32
	H12176_32m_Combined	All	32

Table 5: CARIS HIPS Surface Names, Depth Ranges, and Resolutions.

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H12176 can be found in the *OPR-O193-FA-10 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 correctors from the U.S. Coast Guard beacon at Annette Island (323 kHz) were used during real-time acquisition, and were the sole method of positioning of detached positions (DP) and bottom samples as

there is currently no functionality for applying Single Best Estimate of Trajectory (SBET) files to these types of data. The Post Processing Kinematic method (PPK) is the primary method of horizontal positioning of MBES soundings on H12176. Correctors from a GPS base station established on horizontal control mark URN on Smeaton Island were used for post processing all vessel-day POSMV files. Single Best Estimate of Trajectory files were applied to all MBES data in CARIS HIPS Service Pack 1, Hot Fix 5.

For further details see the SBET and SMRMSG (error) logs for the particular days located with the SBET GNSS data folder submitted with the processed data from this survey.

C.2 Vertical Control

The vertical datum for this project is Mean Lower Low Water (MLLW) as specified in the Project Instructions. The operating National Water Level Observation Network (NWLON) primary tide station at Customhouse Cove, AK, (945-0296) served as control for datum determination and as the primary source for water level correctors for survey H12176.

Refer to the *OPR-O193-FA-10 Horizontal and Vertical Control Report* for further information about the tide stations.

A request for delivery of final approved tides for survey H12176 was forwarded to N/OPS1 on May 24, 2010, in accordance with the FPM. A copy of the request is included in Appendix V.

As per the Project Instructions, all data were reduced to MLLW using final, approved water levels from the Customhouse Cove station (945-0296) by applying tide file 9450296.tid and time and height correctors through the zone corrector file H12176CORF.zdf.[7] **It will not be necessary for the Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.**

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

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

Survey H12176 was compared with the following charts listed in Table 7. There were no new changes within the survey area.[8]

Chart Number	Chart Scale	Edition Number	Edition Date	Corrected through NTM
17424	1:80,000	9th Ed.	2009-10	37/2010
17434	1:80,000	13th Ed.	2005-07	37/2010

Table 7: NOAA Charts compared with Survey H12176

D.1.1 Chart 17424

Surveyed soundings closely agree with charted depths. Similarly, contours generated in CARIS HIPS closely approximated the charted 3, 10, 30 and 100 fathom contours. Generally, surveyed soundings are within one to two fathoms of charted depths.[9] One exception to this general agreement is a charted rocky 8 fathom shoal located approximately ½ nautical mile north of Point Trollop. The surveyed least depth of the shoal is 4.4 fathoms[10] (Figure 13).

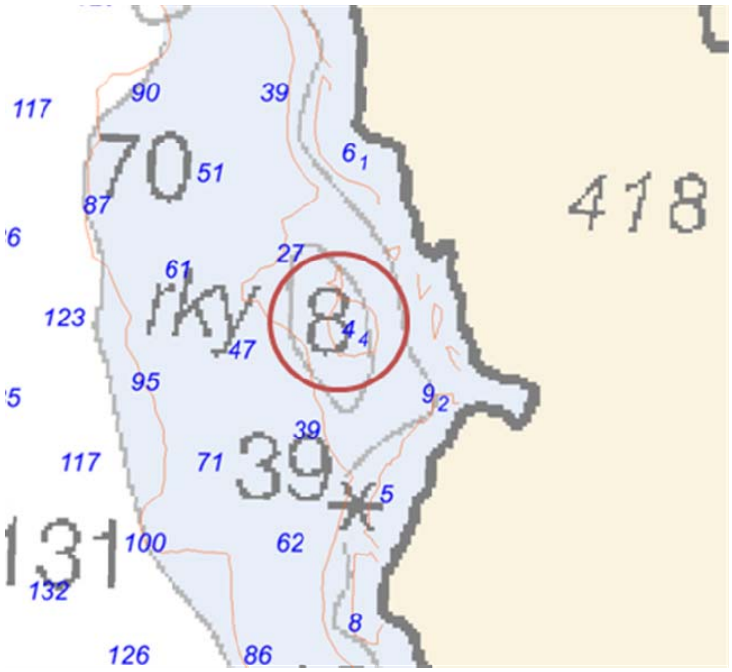


Figure 13: Charted 8 fathom shoal (17424 & 17434) with surveyed soundings overlaid.

D.1.2 Chart 17434

As with chart 17424, surveyed soundings closely agree with the charted depths on chart 17434. Contours generated in CARIS HIPS closely agree the charted 3, 10, 30 and 100 fathom contours.[11] As stated above, the excepetion to overall general agreement is the charted rocky 8 fathom shoal located approximately ½ nautical mile north of Point Trollop with a surveyed least depth 4.4 fathoms[12]. The area near the entrance to Alava Bay has three charted depths that disagree by as much as 20 fathoms from surveyed soundings (Figure 14). Similary, in the near shore area from Ape Point to Fox Point (Figure 15) as well as in the vacinity of Point Nelson (Figure 16) several charted depths are not representative of surveyed soundings in the immediate area. In the near shore area south of Roe Point the charted depth of ¼ fathom disagreed with surveyed sounding of 3 feet or ½ fathom (Figure 17).[13]

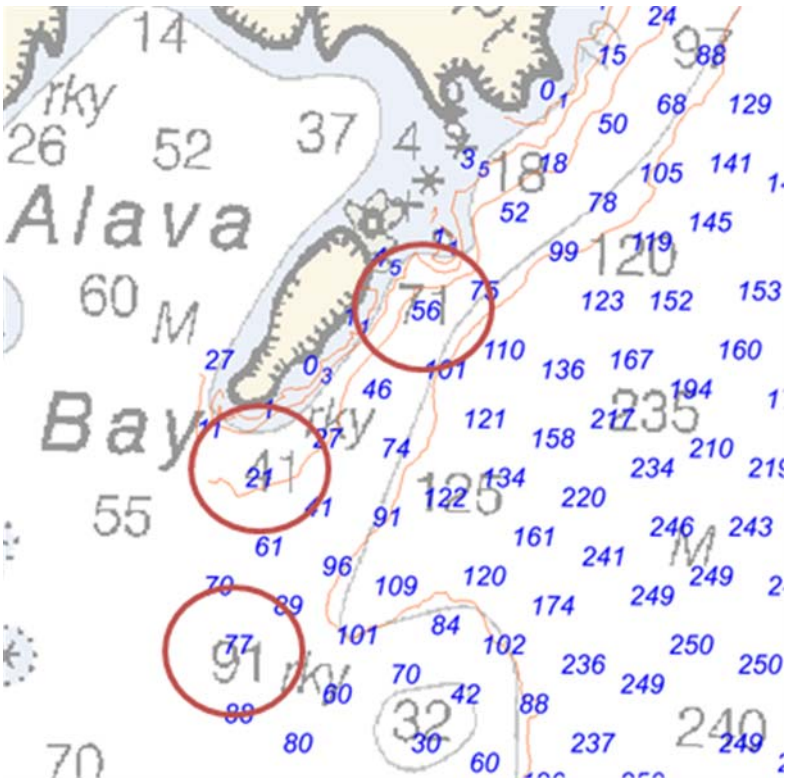


Figure 14: Disagreement between charted depths (17434) and surveyed soundings near Alava Bay.

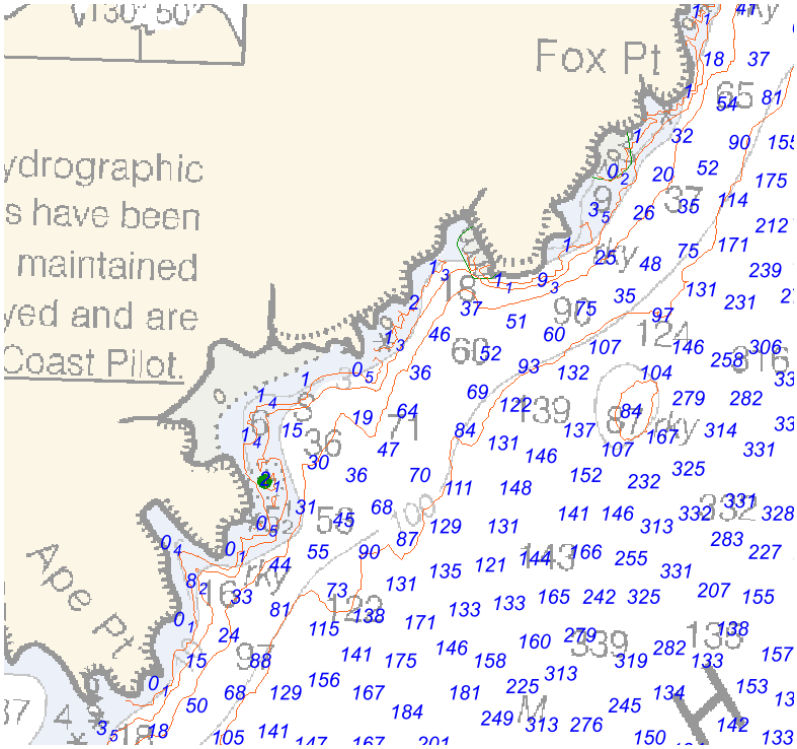


Figure 15: Disagreement between charted depths (17434) and surveyed soundings near shore between Ape Point and Fox Point.

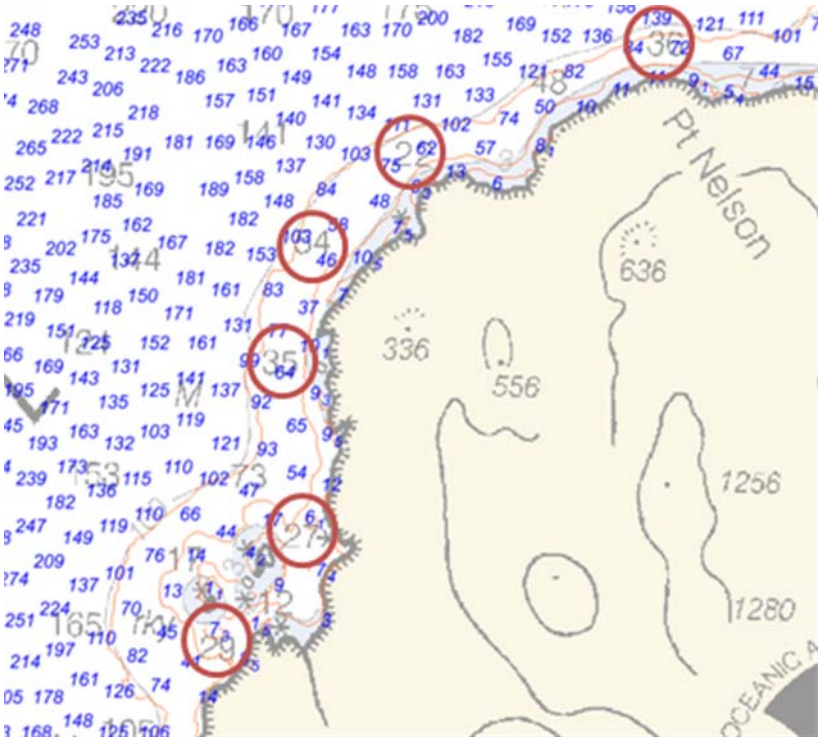


Figure 16: Disagreement between charted depths (17434) and surveyed soundings near shore in the vicinity of Point Nelson.

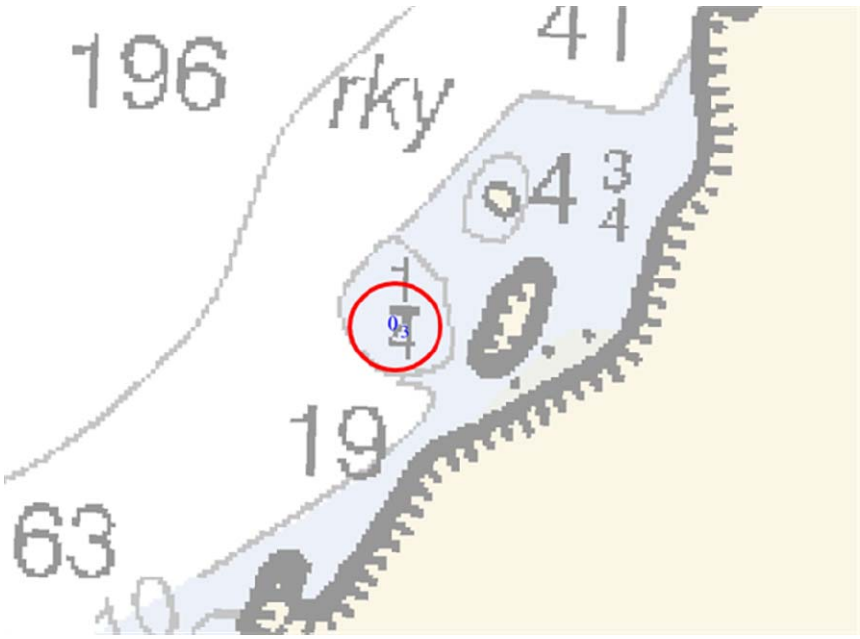


Figure 17: Disagreement between charted depths (17434) and surveyed soundings near shore in the vicinity of Roe Point.

D.1.3 Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the HSSD. **All soundings from H12176 are adequate to supersede prior surveys in their common areas.**[14]

D.2 Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H12176.[15]

D.3 Dangers to Navigation

There were no dangers to navigation found within the survey limits.[16]

D.4 Additional Results

D.4.1 Shoreline/Feature Verification

Fairweather personnel conducted limited shoreline verification and reconnaissance at times near predicted negative tides DN 141, 143 and 144 within the survey limits. Annotations, information, and diagrams collected on DP forms and boat sheets during field operations are scanned with included in the digital Separates I folder. Shoreline verification procedures for survey H12176 conform to those detailed in the DAPR. All field digital photographs are included in the multimedia submission folder. Photos are labeled with the unique identification number and the azimuth, in degrees true, that the photo was taken.

D.4.2 Shoreline/Feature Data Processing

Feature processing procedures were followed as outlined in the DAPR. Within the survey area several charted ledges and mean lower low water lines are in conflict with the contemporary hydrographic data. In accordance with agreements reached with the Hydrographic Branches, these ledge area features were not further processed by field personnel.

D.4.3 Shoreline Recommendations

The Hydrographer recommends that the shoreline depicted in the CARIS Notebook files and final soundings supersede and complement shoreline information compiled on the CSF and charts.[17]

D.4.4 Aids to Navigation

There were no aids to navigation within the survey limits.[18]

D.4.5 Overhead Features

There are no overhead features within the limits of survey H12176.[19]

D.4.6 Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H12176, and none were detected by the survey.[20]

D.4.7 Ferry Routes

There are no ferry routes charted within the limits of survey H12176, and none were observed to be operating in the area.[21]

D.4.8 Bottom Samples

Bottom samples were collected on May 21, 22 & 24, 2010 (DN141, 142 & 144) and are included as seabed area point features in the Notebook H2176_FINAL_FEATURE_FILE .hob file.[22]

D.5 Supplemental Reports

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

Title	Date Sent	Office
Hydrographic Systems Readiness Review 2010	April 9, 2010	N/CS34
Data Acquisition and Processing Report 2010	August 9, 2010	N/CS34
Horizontal and Vertical Control Report for OPR-O193-FA-10	July 26, 2010	N/CS34
Tides and Water Levels Package for OPR-O193-FA-10	May 25, 2010	N/OPS1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
NOAA Ship FAIRWEATHER S-220
1010 Stedman Street
Ketchikan, AK 99901

September 30, 2010

MEMORANDUM FOR: Gary Nelson
Chief, Pacific Hydrographic Branch

FROM: CAPT David O. Neander, NOAA
Commanding Officer

David O. Neander
2010.10.01
09:17:31 -08'00'

TITLE: Approval of Hydrographic Survey H12176,
OPR-O193-FA-10

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H12176 in accordance with the Hydrographic Manual, Fourth Edition; Field Procedures Manual, April 2010; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2010. Additional guidance was provided by applicable Hydrographic Technical Directives. 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.

I acknowledge that all of the information contained in this report is complete and accurate to the best of my knowledge.

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

Matthew Jaskoski
Digitally signed by Matthew Jaskoski
DN: cn=Matthew Jaskoski, o=NOAA, ou=NOAA Ship FAIRWEATHER, email=matthew.jaskoski@noaa.gov, c=US
Date: 2010.10.01 05:14:20 Z

LT Matthew Jaskoski
Survey Manager

Briana J. Welton
Digitally signed by Briana Welton
Date: 2010.10.01 06:56:06 -08'00'

LT Briana Welton
Field Operations Officer

Digitally signed by
Lynnette V. Morgan
Date: 2010.10.01 06:05:59 Z

CST Lynnette V. Morgan
Chief Survey Technician

Attachment

Revisions Compiled During Office Processing and Certification:

---

[1] Concur.
[2] Concur.
[3] No junction was made to H12175 or H12177 as they have not yet been compiled.
[4] Review of data gaps at PHB found no dangerous or significant holidays. No data gaps were preserved in the HCell.
[5] Designated soundings have been applied in the HCell as appropriate to scale and surrounding soundings.
[6] Concur.
[7] Tide note appended to this report.
[8] Data were also compared with the eastern edge of chart 17428, 1:40,000. Data compared well with charted data. No major changes significant to surface navigation were noticed.
[9] Concur.
[10] The sounding has been selected for charting, however the post processing depth is 4 fathoms and 5 ft.
[11] Concur.
[12] Correction; 4 fathoms 5 feet, see end note10.
[13] Concur.
[14] Concur, chart soundings selected in H12176_CS.000
[15] Concur.
[16] Concur.
[17] Concur with clarification, shoreline depicted in the CARIS Notebook files and final soundings delivered from the field were used in the compilation of H12176_CS.000, however modifications were made at the Pacific Hydrographic Branch. Chart features as depicted in H12176_CS.000.
[18] Concur.
[19] Concur.
[20] Concur.
[21] Concur.
[22] No surveyed bottom samples were used in the compilation of H12176_CS.000 due to the rocky nature of the seafloor. Chart rocky seabed areas as depicted in the HCell.

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : July 22, 2010

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O193-FA-2010
HYDROGRAPHIC SHEET: H12176

LOCALITY: Alava Bay to Mouth of Smeaton Bay, Behm Canal, AK
TIME PERIOD: May 9 - May 22, 2010

TIDE STATION USED: 945-0296 Custom House Cove, AK
Lat. 55° 5.77'N Long. 131° 13.33' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.369 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA75 and SA76

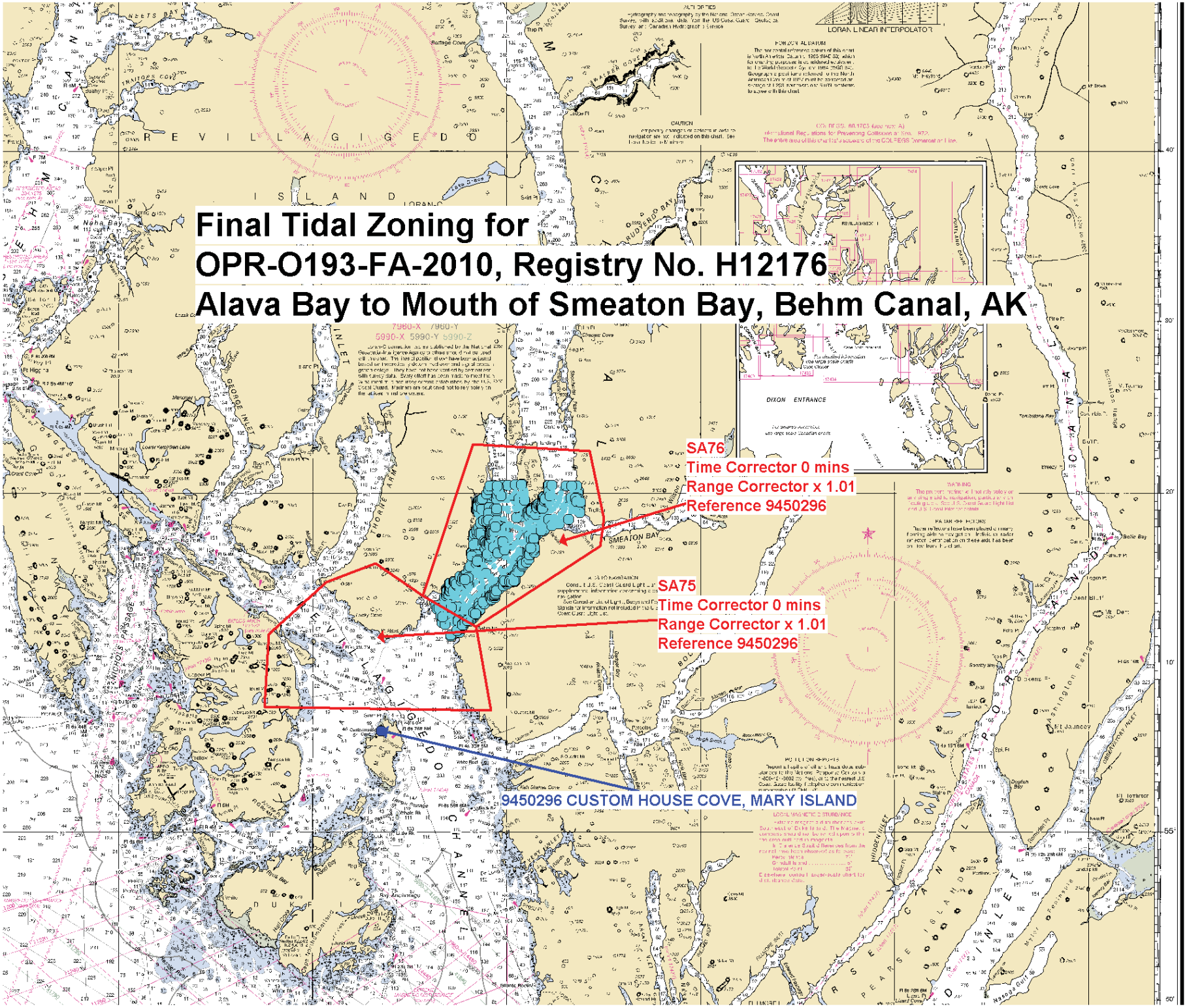
Refer to attachments for zoning information.

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=NOAA/NOS/CO-OPS, ou=Oceanographic Division, email=peter.stone@noaa.gov, c=US
Date: 2010.07.23 15:15:00 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION


Final Tidal Zoning for
OPR-O193-FA-2010, Registry No. H12176
Alava Bay to Mouth of Smeaton Bay, Behm Canal, AK
SA76
Time Corrector 0 mins
Range Corrector x 1.01
Reference 9450296
SA75
Time Corrector 0 mins
Range Corrector x 1.01
Reference 9450296
9450296 CUSTOM HOUSE COVE, MARY ISLAND
SMEATON BAY
DIXON ENTRANCE

H12176 HCell Report

Peter Holmberg, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H12176 used:

Office of Coast Survey HCell Specifications: Version: 4.0, 2 June, 2010.
HCell Reference Guide: Version 2.0, 2 June, 2010.

2. Compilation Scale

Depths and features for HCell H12176 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
17434	1:80,000	13th	07/01/2005	01/15/2011
17428	1:40,000	10th	04/01/2007	01/15/2011

The following ENCs were also used during compilation:

Chart	Scale
US4AK4SM	1:80,000
US5AK47M	1:40,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 32-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	200	5

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

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 Charts 17428 & 17434	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 H12176_SS.000
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.9476	20.750	20
50	91.44	92.812	50.750	50
100	182.88	184.252	100.750	100

With the exception of the zero contours included in the *_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the *_CS file and soundings in the *_SS have been. This may result in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_QUAL, 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 H12176:

M_QUAL
M_CSCL

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. Spatial Framework

7.1 Coordinate System

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

7.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

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

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

BASE Editor and S-57 Composer Units:

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

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

8. Data Processing Notes

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

9. QA/QC and ENC Validation Checks

H12176 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.

10. Products

10.1 HSD, MCD and CGTP Deliverables

H12176_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H12176 _SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:10,000
H12176 _DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12176 _outline.gml	Survey outline
H12176 _outline.xsd	Survey outline

10.2 Software

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

11. Contacts

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

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

APPROVAL SHEET
H12176

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.

Digitally signed by Pete Holmberg
DN: cn=Pete Holmberg, o=NOAA, ou=PHB, email=peter.holmberg@noaa.gov, c=US
Date: 2011.02.10 10:42:36 -08'00'

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or 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.

Digitally signed by Kurt Brown
Date: 2011.02.14 09:28:33 -08'00'

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.

Digitally signed by Gary C. Nelson
DN: cn=Gary C. Nelson, o=NOAA, ou=Pacific Hydrographic Branch, email=gary.nelson@noaa.gov, c=US
Date: 2011.02.11 11:31:53 -08'00'

Paul Turner
AWOIS & SURF Check
2011.02.18 13:14:17 -05'00'