H12144

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No.

Registry No. H12144

LOCALITY

State Alaska

General Locality Northern Glacier Bay

Sublocality Northern Extent of Muir Inlet to Wachusett Inlet

2009

CHIEF OF PARTY

Captain David O. Neander, NOAA

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DATE

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

REGISTRY No

HYDROGRAPHIC TITLE SHEET

H12144

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:

State: **Alaska**

General Locality: **Northern Glacier Bay**

Sub-Locality: **Northern Extent of Muir Inlet to Wachusett Inlet**

Scale: **1:40,000** Date of Survey: **October 22, 2009 - November 03, 2009**

Instructions dated: **9/2/2009** Project No.: **OPR-O351-FA-09**

Vessel(s): **NOAA Ship Fairweather (S220), FA Launches 1010 & 1018, Ambar 2302, RA Launches 2801 & 2802**

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

Surveyed by: **FAIRWEATHER Personnel**

Soundings by: **Reson 7111, Reson 8160, Reson 8101, Reson SeaBat 7125**

SAR by: **Kurt Mueller** Compilation by: **Katie Reser**

Soundings compiled in: **Fathoms**

REMARKS: **All times are UTC. UTM Zone 8N.**

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts.

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 H12144

Project OPR-O351-FA-09
Glacier Bay, Alaska
Scale 1:40,000
October - November 2009
NOAA Ship *Fairweather*
Chief of Party: Captain David O. Neander, NOAA

A. AREA SURVEYED

The survey area was located in Glacier Bay National Park, within the sub-locality of the Northern Extent of Muir Inlet to Wachusett Inlet. This survey corresponds to Sheet E in the sheet layout provided with the Project Instructions, as shown in Figure 1 below.

Data acquisition was conducted from October 22 to November 3, 2009 (DN 295 to DN 307).

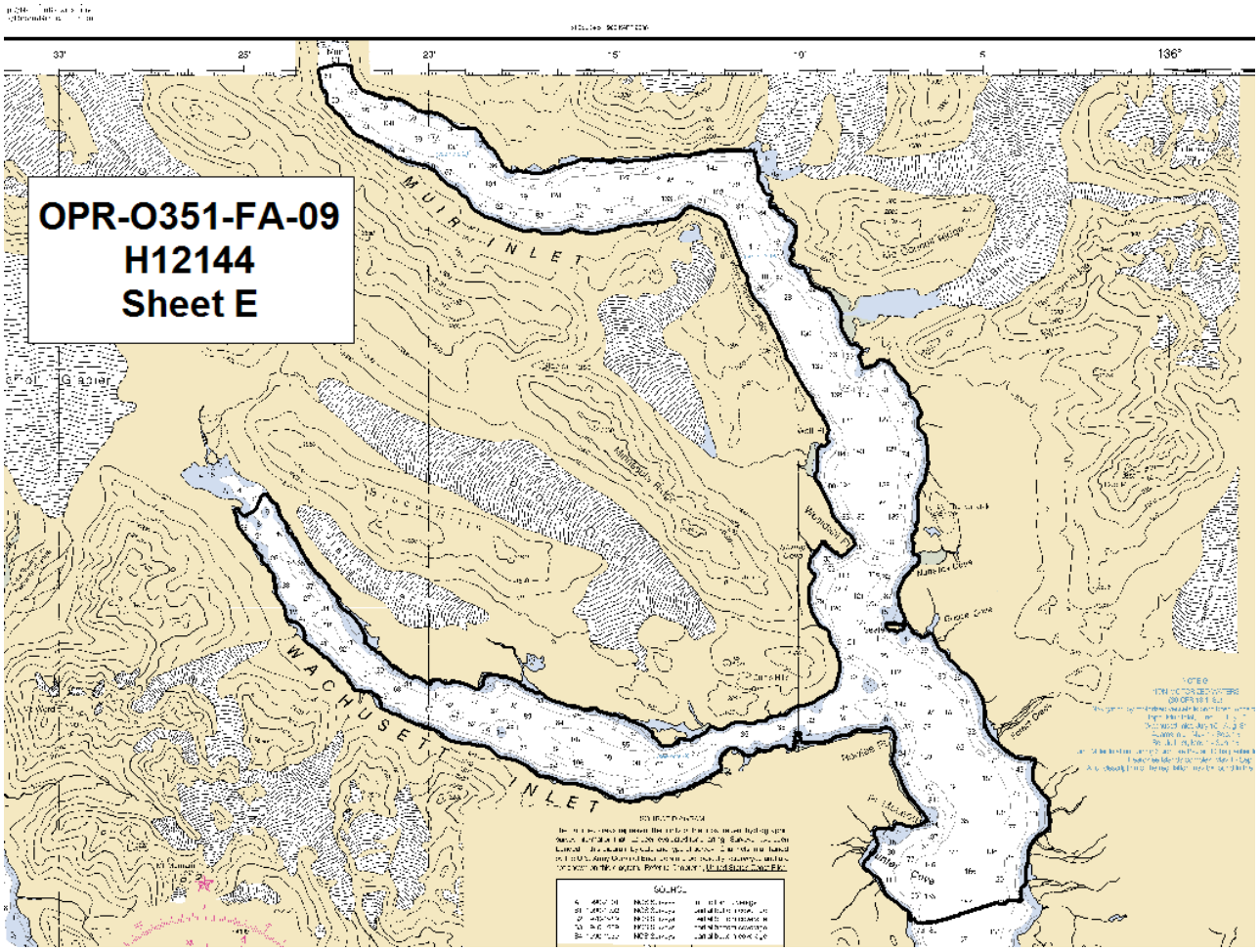

Figure 1: H12144 Survey Outline

Complete multibeam echosounder (MBES) coverage was obtained in the survey area to at least the 4-meter curve or the Mean High-Water Buffer Line in the survey area. Data were acquired as close to shore as safely possible. Additional coverage was obtained in order to determine least depths over features or shoals. Where appropriate, shoreline features were given S-57 attribution and included for submission in Notebook .hob files.

Mainscheme and crossline mileage for MBES and shoreline acquisition were calculated and are displayed in Table 1 below.

MAIN SCHEME - Mileage		
0	**Single Beam MS**	
315.06	**Multibeam MS mileage**	
	46.83	*Fairweather* S-220
	79.50	Launch 1010
	32.62	Launch 1018
	71.61	Launch 2801
	84.50	Launch 2802
0	**Side Scan MS**	
315.06	**Total MS**	
CROSSLINE - Mileage		
0	**Single Beam XL**	
18.52	**Multibeam XL**	
	0.00	*Fairweather* S-220
	0.00	Launch 1010
	0.00	Launch 1018
	13.07	Launch 2801
	5.45	Launch 2802
18.52	**Total XL**	
OTHER		
0	**Developments/AWOIS - Mileage**	
0	**Shoreline/Nearshore Investigation - Mileage**	
31	**Total # of Investigated Items**	
0	**Total Bottom Samples**	
26.39	**Total SNM**	
10/22, 10/23, 10/26, 10/27, 10/28 ,3/11		**Specific Dates of Acquisition**
Dn 295, 296, 299, 300, 301, 307		**Specific Dn#s of Acquisition**

Table 1: H12144 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* 2009 *Data Acquisition and Processing Report* (DAPR), submitted under separate cover. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections. This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions OPR-O351-FA-09, dated September 2, 2009.

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	Launch 1010	Launch 1018	Launch 2801	Launch 2802	Ambar 2302
Hull Registration Number	S220	1010	1018	2801	2802	2302
Builder	Aerojet-General Shipyard	The Boat Yard, Inc.	The Boat Yard, Inc.	All American Marine	All American Marine	Marine Silverships, Inc
Length Overall	231 feet	28’ 10”	28’ 10”	28’ 10”	28’ 10”	23’
Beam	42 feet	10’ 8”	10’ 8”	10’ 8”	10’ 8”	9’ 4”
Draft, Maximum	15’ 6”	4’ 0” DWL	4’ 0” DWL	4’ 0” DWL	4’ 0” DWL	1’ 4”
Cruising Speed	12.5 knots	24 knots	24 knots	24 knots	24 knots	22 knots
Max Survey Speed	6 knots	6 knots	6 knots	6 knots	6 knots	
Primary Echo-sounder(s)	RESON 7111 & RESON 8160	RESON 8101	RESON 8101	RESON 7125	RESON 7125	
Sound Velocity Equipment	SBE 19plus, MVP 200, SVP70	SBE 19plus	SBE19plus	SBE19plus	SBE19plus	
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, Shore Station

Table 2: Vessel Inventory

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

B.2. Quality Control.

B.2.1. Crosslines

Multibeam crosslines for this survey totaled 18.52 linear nautical miles (lnm), comprising 5.88% of the 315.06 lnm of mainscheme MBES hydrography. Both main scheme and crossline mileage are summarized in Table 1 above.

Surface differencing in CARIS Bathy Database was used to assess crossline agreement with main scheme lines. Figure 2 shows a visual depiction of the differences spatially. While the mainscheme and crossline surfaces tend to agree, the most significant differences are noted in the the most steeply sloping portion of the survey area along the inlet walls.[1]

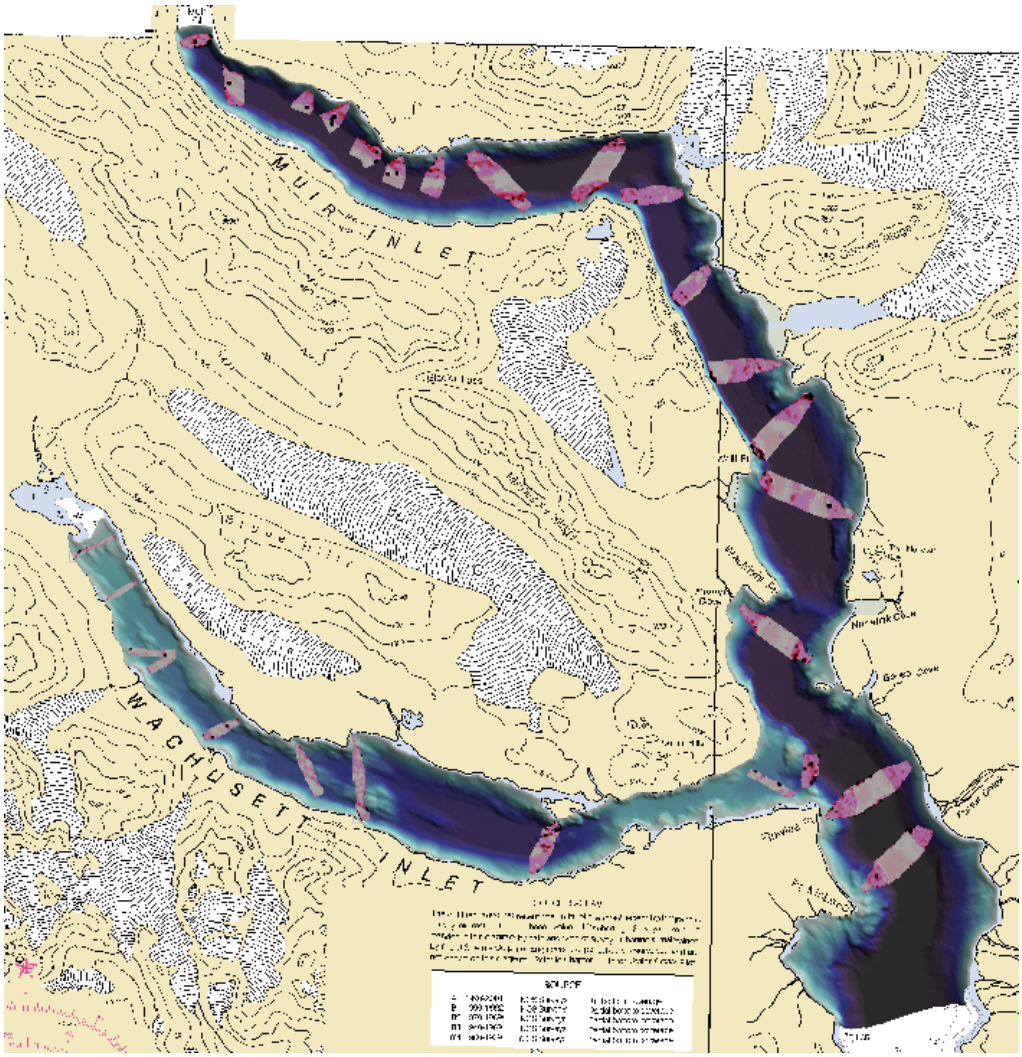

Figure 2: Crossline and main scheme differences

(light pink indicates agreement with main scheme lines; dark pink/red indicates greater differences).

B.2.2. Junctions

Survey H12144 junctions with H12143, which is Sheet D of the same project.[2] Survey H12143 of the same project covers the southern extent of Muir Inlet. Data were acquired on sheet H12143 during October and November of 2009 roughly around the same time as data acquired on H12144. The area of overlap between the sheets was reviewed using CARIS Subset Editor as well as CARIS Bathy Database Surface Differencing and the surveys agree within 1-2 meters in depths shoaler than 100 meters (Figure 4).[3] The greatest differences, 3-5 meters, occur in depths of approximately 300 meters where the Reson 7111 data has sound velocity and bottom detection issues (see section B.4 of this report).[4] The sheet limits and areas of overlap are shown in Figure 3.

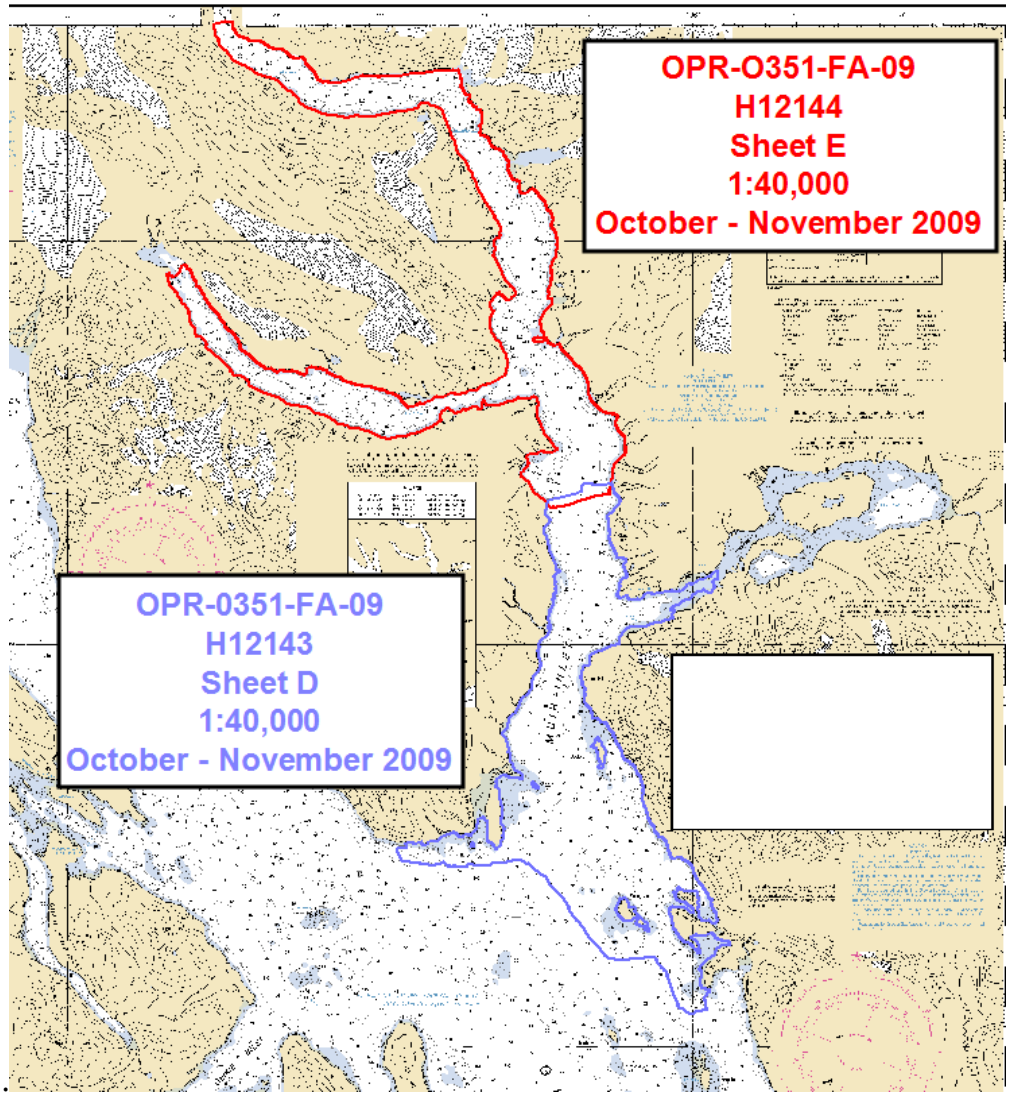

Figure 3: Junction between H12143 and H12144.

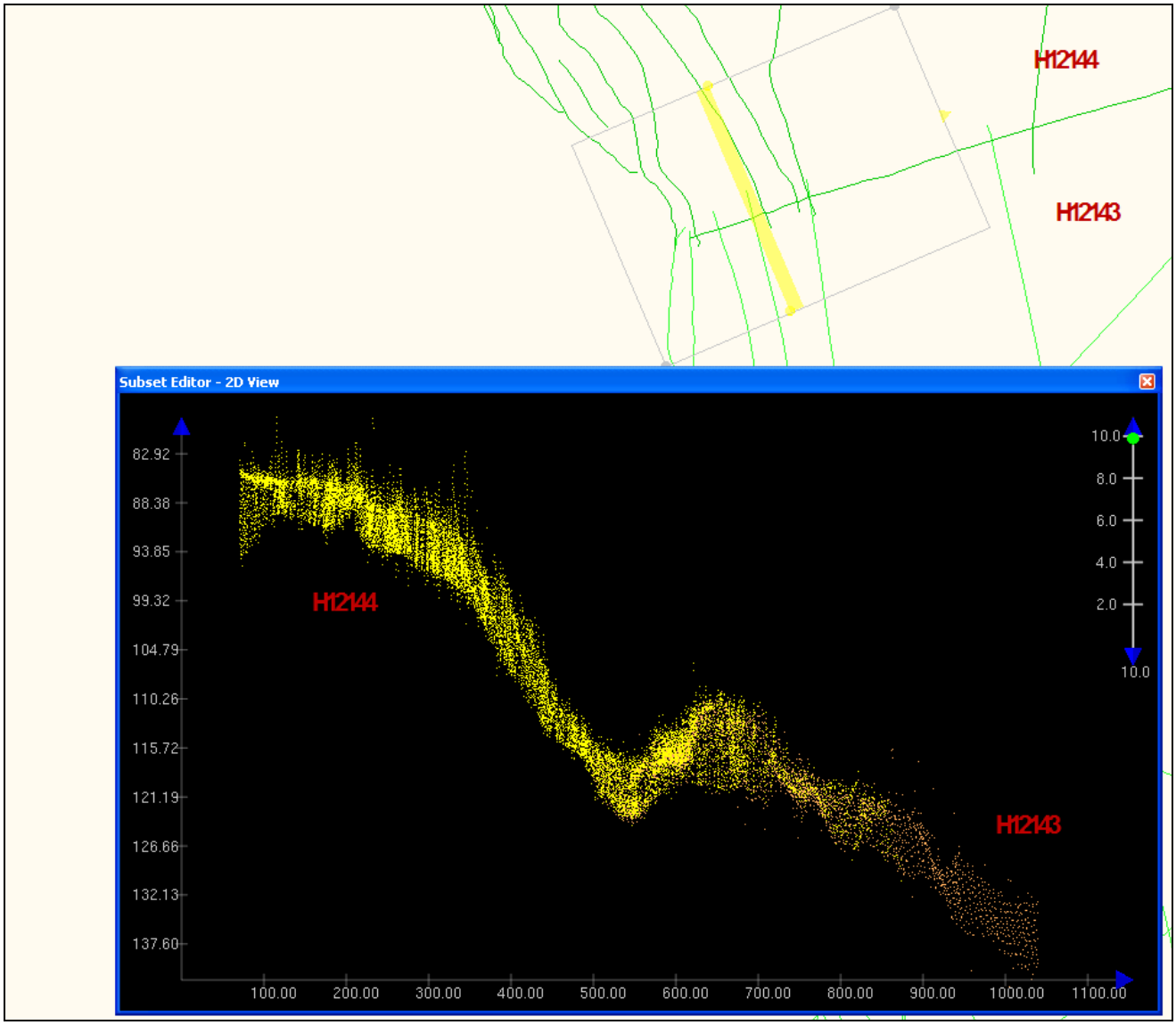

Figure 4: H12143 Junction Subset.

B.2.3. Quality Control Checks

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

B.2.4. Data Quality Factors

COVERAGE ASSESSMENT:
Sheet H12144 contained no holidays larger in area than three surface nodes. Complete MBES coverage was obtained for all areas within the sheet limits, seaward of the MHW Buffer Line and/or the 4-meter curve.[5]

TRUEHEAVE:
To enable the application of true heave some POS/MV true heave files were "fixed" using the *fixTrueHeave.exe* utility from CARIS. Fixed files were assigned an additional *.fixed suffix. This was performed for the following vessels and days[6]:

Launch 1010: DN 296

Launch 1018: DN 301

Launch 2801: DN296 (including secondary 'B' file)

SOUND VELOCITY:
The extended depth sound speed values generated by Velociwin were deleted for casts whose extended depths were deemed implausible by the Hydrographer.[7]

BOTTOM SAMPLES:
Bottom samples were not collected due to time constraints and the great depth of much of the survey area. The Hydrographer recommends existing charted bottom characteristics be retained.[8]

DESIGNATED SOUNDINGS:
Designation of soundings followed the criteria outlined in section 5.1.1.3 of the NOS Hydrographic Surveys Specifications and Deliverables (HSSDM) dated April 2009. There are seven (7) total designated soundings in H12144, all of which were submitted as Dangers to Navigation (DTONs).[9]

UNUSUAL CONDITIONS:
The steep slope of the inlet walls throughout the entire perimeter of the survey were difficult to survey with the Reson 7125 MBES. Outer beams on the downslope side of the swath were "lost" out of range and consequently appeared as a relatively consistent flier' in the MBES data. Multibeam echosounder bathymetry acquired over the glacial silt and mud bottom types near the extents of Muir Inlet and Wachusett Inlet required intensive sonar tuning and heavily overlapping coverage patterns. As a result, these areas have high data densities and also, significant noise which was rejected in CARIS HIPS.[10]

B.2.5. Accuracy Standards

A notable portion of the surface node uncertainties are larger than the total allowable vertical uncertainty for their respective depths. This can be seen in Figures 5 and 6 below in which red nodes have uncertainty values larger than IHO Order I vertical tolerances. The soundings contributing to these nodes are mainly nearshore on steep slopes in depths shoaler than 100 meters resulting in higher uncertainty.[11] All surface nodes are within IHO Order 2 tolerances. All CUBE surfaces, regardless of IHO status, were

examined by the Hydrographer in Caris HIPS and SIPS subset editor and 3-D viewer, and the data accurately represent the seafloor and are adequate to supersede the chart.[12]

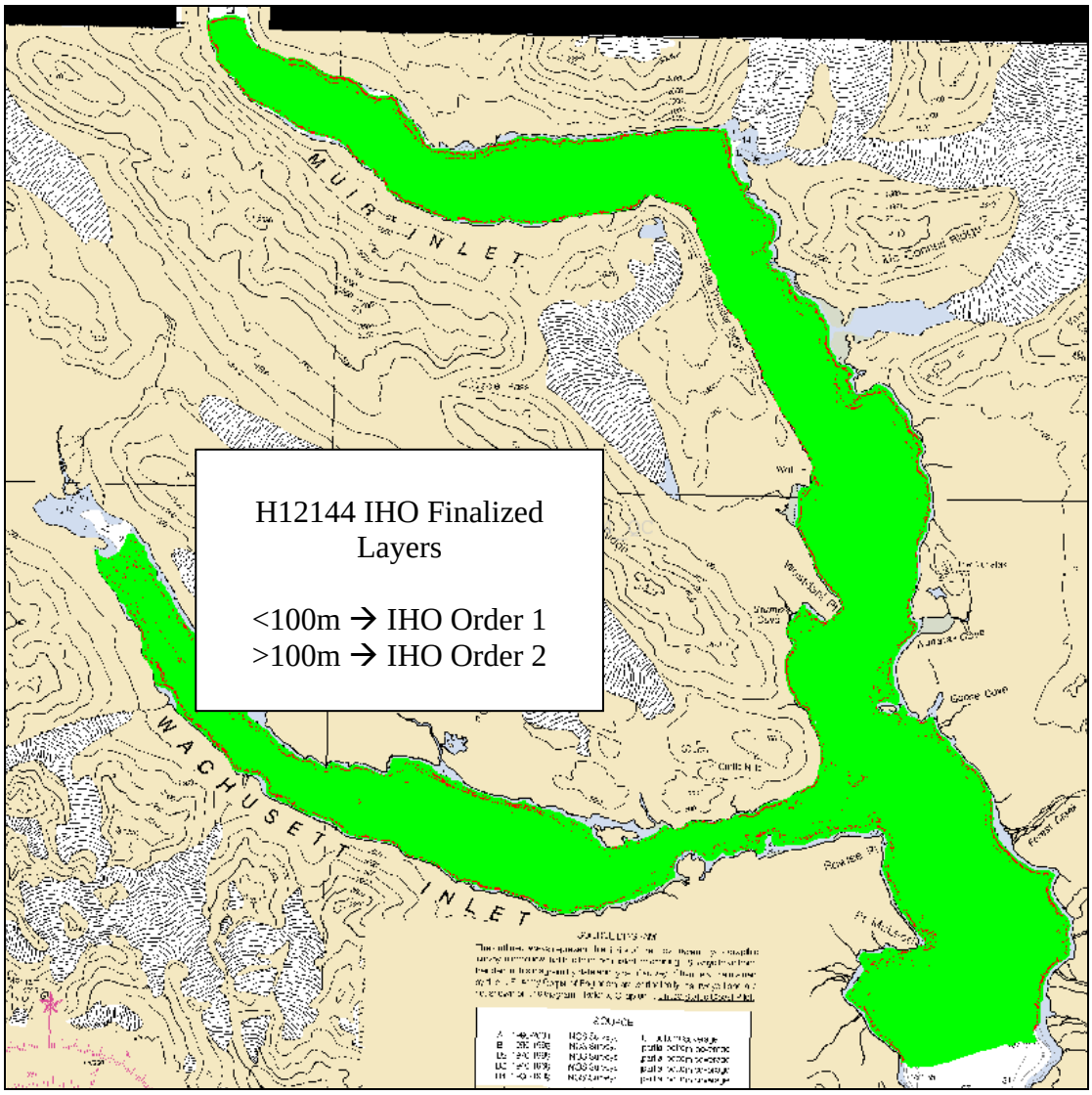

Figure 5: IHO Layers for Finalized CUBE Surfaces

[Pass (green) or Fail (red)].

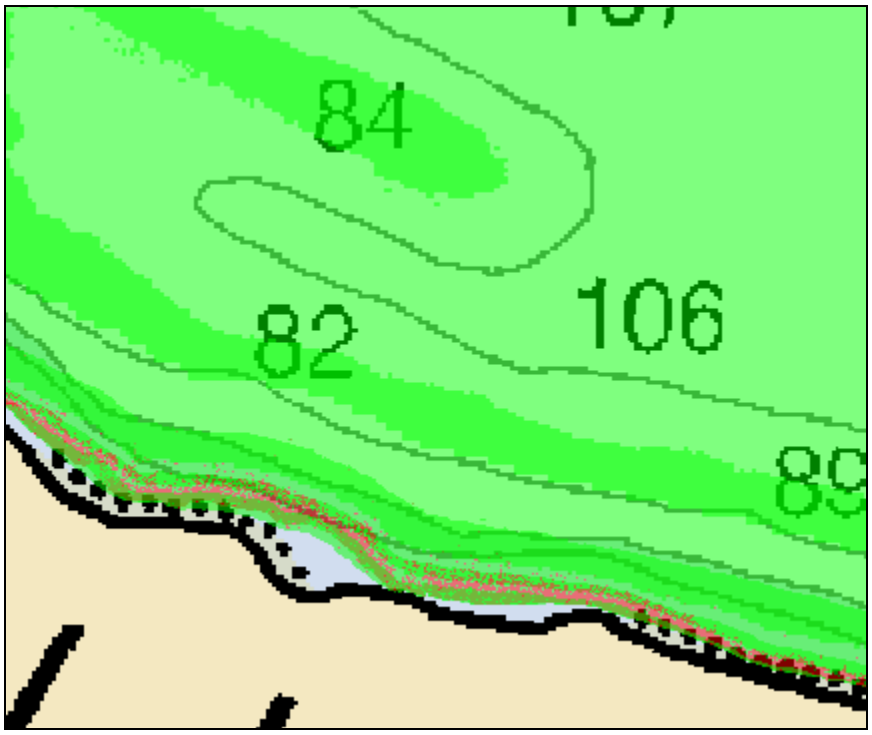

Figure 6: Detail View of IHO "fail" area.

B.3. Corrections to Echo Soundings

Data reduction procedures for survey H12144 conform to those detailed in the DAPR with the exceptions discussed in this report.

B.4. Data Processing

Initial data acquisition and processing notes are included in the acquisition and processing logs. Additional processing information such as application of final tides and sound velocity are contained in the Reviewer_Qry tab of the H12144 Data_Log spreadsheet. All of the logs are submitted digitally in the Separates I folder.

Data processing procedures for survey H12144 conform to those detailed in the DAPR except where noted in this report. Data were processed initially using CARIS HIPS & SIPS Version 7.0, Hotfixes 3, 5, and 6 beta. During the course of survey processing computer systems processing and finalizing data for submission were updated to CARIS HIPS & SIPS v 7.0, Service Pack 1 beta and Service Pack 1 Hotfixes 3 and 4. All post-conversion processes were ultimately executed and/or re-excecuted in HIPS v7.0 HF 4. Additional processing details regarding Total Propagated Uncertainty (TPU/TPE) and CUBE (Combined Uncertainty and Bathymetry Estimator) Surfaces and Parameters utilized, along with any deviations from the processing procedures outlined in the DAPR are discussed below.

TPU VALUES:
The survey specific parameters used to compute TPU in CARIS for H12144 are listed in Table 4.

Tide values:	**Measured**	0.01 m	**Zoning**	0.20 m
Sound Speed Values:	**Measured**		**Surface**	
	Reson 8101	1.00 m/s		1.00 m/s
	Reson 7125/8125	1.00 m/s		0.50 m/s
	Reson 7111/8111	0.50 m/s		0.50 m/s

Table 4: Survey Specific CARIS TPE Parameters

CUBE SURFACES:
The CARIS HIPS CUBE surfaces created and the associated resolutions are listed below in Table 5.[13]

The CUBE parameters utilized for creating surfaces are included in Table 5. The CUBE parameters .xml file is included with digital data in the vessel configuration folder.

The surfaces have been reviewed where noisy data, or 'fliers' are incorporated into the gridded solution causing the surface to be shoaler than the true seafloor. Where these spurious soundings cause the gridded surface to be shoaler than the reliably measured seabed by greater than the maximum allowable total vertical uncertainty at that depth, the noisy data have been rejected and the surface recomputed.

Fieldsheet Name	Surface Name	Depth Ranges (m)	Resolution (m)	CUBE Parameters
H12144_QC	H12144_1m	All	1	NOAA_1m
H12144_QC	H12144_2m	All	2	NOAA_2m
H12144_QC	H12144_4m	All	4	NOAA_4m
H12144_QC	H12144_8m	All	8	NOAA_8m
H12144_QC	H12144_16m	All	16	NOAA_16m
H12144_QC	H12144_1m_Final_ 0to23	0-23	1	NOAA_1m
H12144_QC	H12144_2m_Final_18to40	18-40	2	NOAA_2m
H12144_QC	H12144_4m_Final_35to80	35-80	4	NOAA_4m
H12144_QC	H12144_8m_Final_75to160	75-160	8	NOAA_8m
H12144_QC	H12144_16m_Final_155to900	1155-900	16	NOAA_16m
H12144_QC	H12144_Combined-16m	0-900	16	

Table 5: Depth Ranges, Resolutions, and CUBE Parameters

HIPS DEVICE MODEL FOR RESON 7111:
During initial processing of H12144 the uncertainty values associated with CUBE surfaces created with Reson 7111 data were unusually high and well outside of allowable IHO vertical tolerances. Reson and and CARIS were contacted and ultimately the device model for the CARIS HIPS device model was corrected with appropriate parameters for the Reson 7111. All Reson 7111 HIPS HDCS data have been remerged using the updated device model and affected CUBE surfaces regenerated. Additional documentation regarding this issue is included in Appendix V Supplemental Survey Records & Correspondence of this report.[14]

RESON 7111 REAL-TIME PITCH STABILIZATION:
The Reson 7111 is a pitch-stabilized system that is designed to apply real time pitch correction data sent via Ethernet from the POS/MV to the Reson 7111 to improve beam steering. However, during post

acquisition data analysis of the Reson 7111 acquired on H12143, a junction survey, a small Hypack Hysweep .7k file was sent to LT Samuel Greenaway at the University of New Hampshire for decoding and it was determined that real-time pitch data was not applied in real-time during the acquisition of that individual file. Though *Fairweather* is not equipped with tools to determine whether all Reson 7111 files acquired on OPR-O351-FA-10 were pitch-corrected during real-time data acquisition, it is suspected that none of the files acquired were pitch stabilized. The Reson 7111 CARIS HVF used to process data acquired on OPR-O351-FA-10 is set to apply pitch during post processing. Furthermore, the weather during acquisition was generally calm resulting in small pitch measurements, and is not attributable to any surface artifacts. Though this and various other issues with the Reson 7111 system remain under investigation these data are deemed adequate to supersede the chart.[15]

RESON 7111 OUTER BEAMS AND CLEANING:
During post processing of H12144, various data quality issues with Reson 7111 data were identified, the most significant of which are apparent in "flakey", "spidery" outer beams, which ultimately lead to a new bottom detection algorithm to be implemented in the Reson processing software. Because the raw Reson 7111 data acquired on H12144 could not be reprocessed or corrected to fix the outer beams issues, the outer beams were manually cleaned in CARIS HIPS Swath Editor in areas where outer beams from the Reson 7111 do not align with adjacent lines. Additionally, data from Reson 7111 lines 2009E_2952242, 2009E_2992126, and, 2009E_2992240 were filtered to 60° on the starboard beams (down-slope) in order to reduce the influence of down-slope noise on the CARIS CUBE surfaces.

C. HORIZONTAL AND VERTICAL CONTROL

A complete description of horizontal and vertical control for survey H12144 can be found in the *OPR-O351-FA-09 Horizontal and Vertical Control Report* (HVCR), 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). The U.S. Coast Guard beacon at Gustavus (288.0 kHz) was used for real-time Differential Global Positioning System (DGPS) corrections during multi-beam acquisition.

The SingleBase Post Processed Kinematic method (PPK) was the primary method of horizontal positioning for most soundings during survey H12144. Correctors from a GPS base station established on horizontal control mark, LAST, on Westdahl Point were used from DN 295 (October 22, 2009) to DN 299 (October 26, 2009). A base station on horizontal control mark SOG on Sebree Island was used on days numbered 300 and 301 (October 27th & 28^{th,} 2009). Smoothed Best Estimated Trajectory (SBET) files were applied to the data in CARIS HIPS and SIPS. Precise Point Positioning (PPP) was used to correct data acquired by Launch 1018 on DN 301 (October 29^{th,} 2009) and Launch 2801 on DN 307 (November 3, 2009) where base station data were unavailable or unusable for PPK. All raw base station files are submitted with the HVCR digital data for this project.

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

Elfin Cove, AK (945-2634) served as control for datum determination and as the primary source for water level correctors for survey H12144.

Fairweather personnel installed Sutron 8210 "bubbler" tide gauges at the tertiary stations listed below in Table 7. The gauges were installed in order to provide information to the Center for Operational Oceanographic Products and Services (CO-OPS N/OPS1) for the determination of time and height correctors, in accordance with the Project Instructions.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal	Gauge #	S/N
Composite Island	945-2682	Tertiary 30 Day	September 25, 2009	Nov 6, 2009	12	85173
Muir Inlet	945-2584	Tertiary 30 Day	September 26, 2009	Nov 7, 2009	10	97043
Wachusett Inlet	945-2632	Tertiary 30 Day	October 12, 2009	Nov 11, 2009	17	79049
Tarr Inlet	945-2749	Tertiary 30 Day	October 8, 2009	Nov 8, 2009	14	86002

Table 7: Tide Gauge Information

Refer to the *OPR-O351-FA-09 Horizontal and Vertical Control Report* for further information about the tide stations.

A request for delivery of final approved (smooth) tides for survey H12144 was forwarded to N/OPS1 on November 20, 2009, in accordance with the Field Procedures Manual (FPM), dated April 2009. A copy of the request is included in Appendix V. Final tides were received on April 6, 2010.

As per the final Tide Note from CO-OPS, all data were reduced to MLLW using the final approved water levels (smooth tides) from the Muir Inlet station (945-2584) and Wachusett Inlet station (945-2632) by applying tide files 9452584.tid and 9452632.tid and time and height correctors through the zone corrector file H12144CORF.zdf.[16] **It will not be necessary for the Atlantic Hydrographic Branch to reapply the final approved water levels (smooth tides) to the survey data during final processing.**[17]

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 HSSDM, utilizing Caris Bathy DataBASE software program.

Survey H12144 was compared with the following charts listed in Table 8.

NOAA Chart Number	Chart Scale	Edition Number	Edition Date	Updated with Notice to Mariners through
17318	1:80,000	7th Ed.	March, 2009	November 1, 2009

Table 8: NOAA Charts compared with Survey H12144

D.1.1. Chart 17318

Soundings from survey H12144 generally agree within one to two fathoms with depths on chart 17318.[18] Charted depths at and near the extents of Muir Inlet and, particularly, Wachusetts Inlet, differ greatly with surveyed depths. As previously noted, significant shoaling has occurred at the extent of Wachusett Inlet, due to the accumulation of sediment from the inflow of glacial melt-water. A shoal point near the entrance to Wachusett Inlet (see figure 12) has decreased in depth from 3 fathoms, 4 feet and 1 fathom, 4 feet.[19]

Existing charted contours within the extents of sheet H12144 generally remained consistant with those derived from MBES data collected during this survey.[20]

A general shift in the shoreline was apparent thoughout most of Muir Inlet and Wachusett Inlet. In both inlets, the charted MHW line shifted slightly to the South. This is most apparent when comparing the shoreward extents of MBES coverage with the charted shoreline.[21]

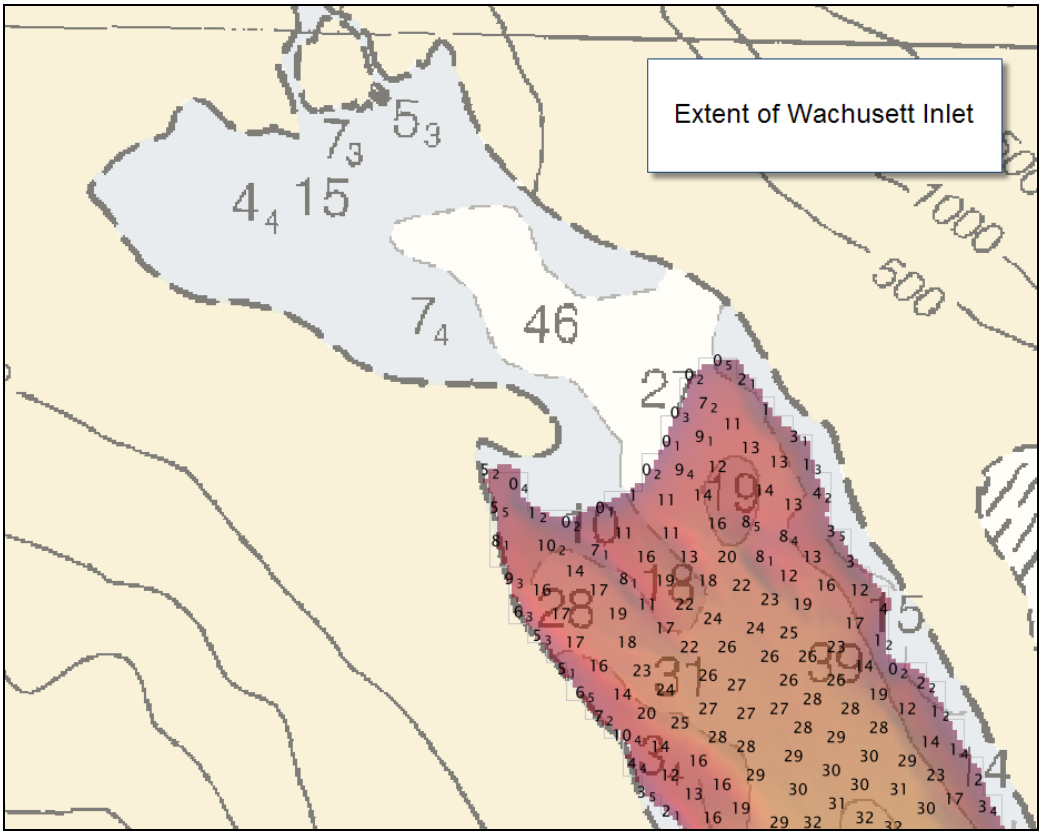

Figure 11: Shoaling at Extent of Muir Inlet.

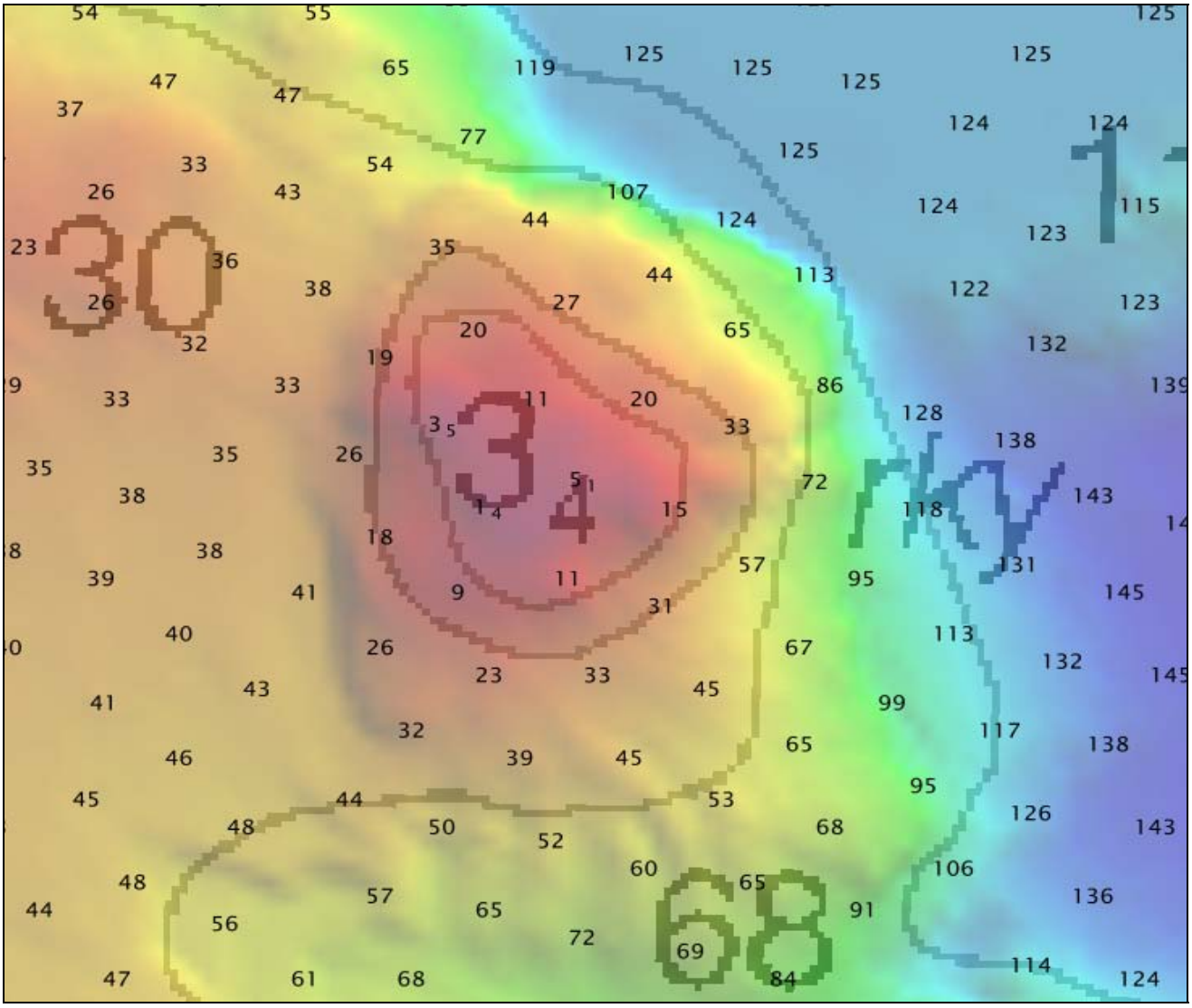

Figure 12: Shoaling Near Entrance of Wachusett Inlet.

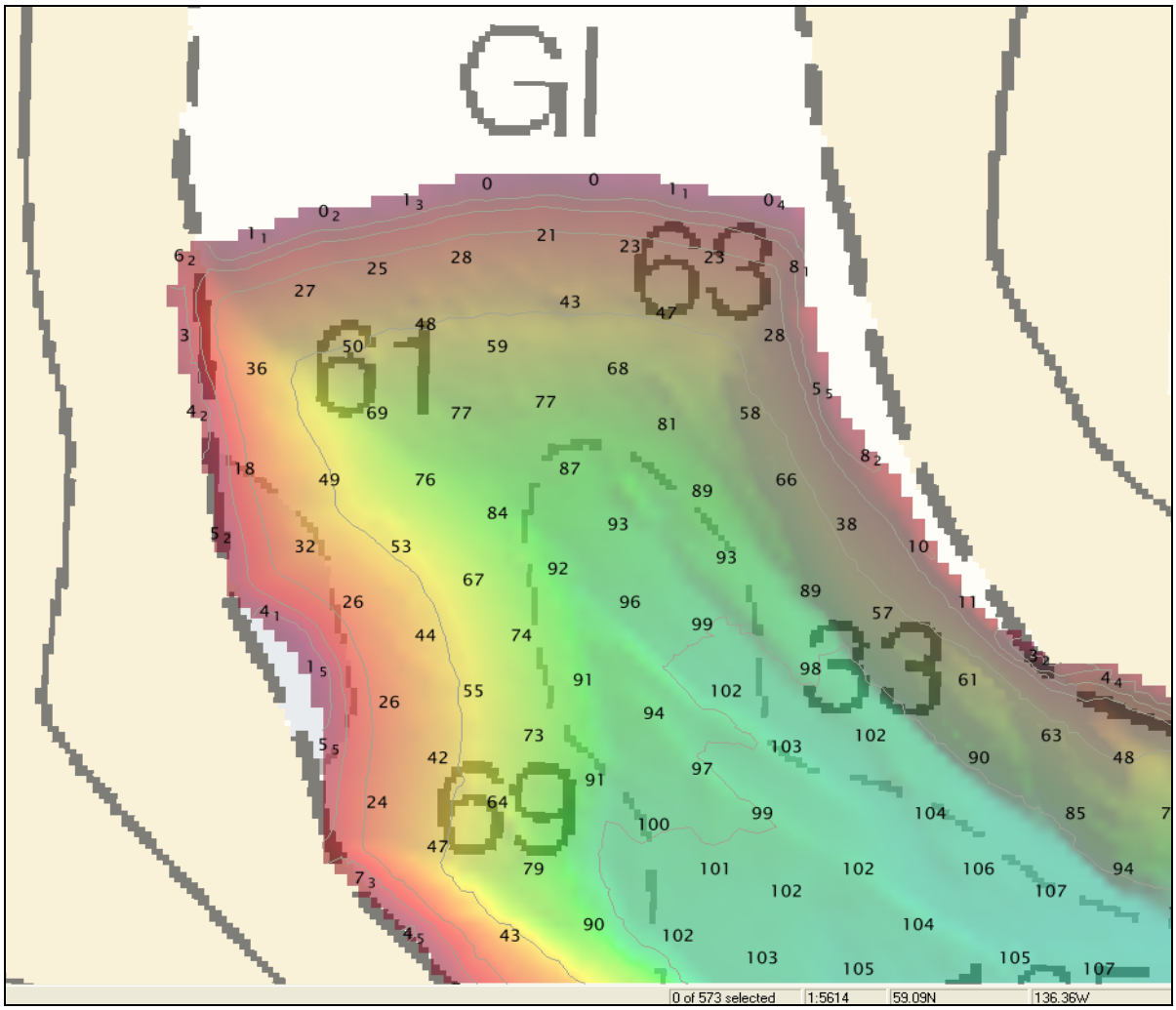

Figure 13: Shoaling at Extent of Muir Inlet

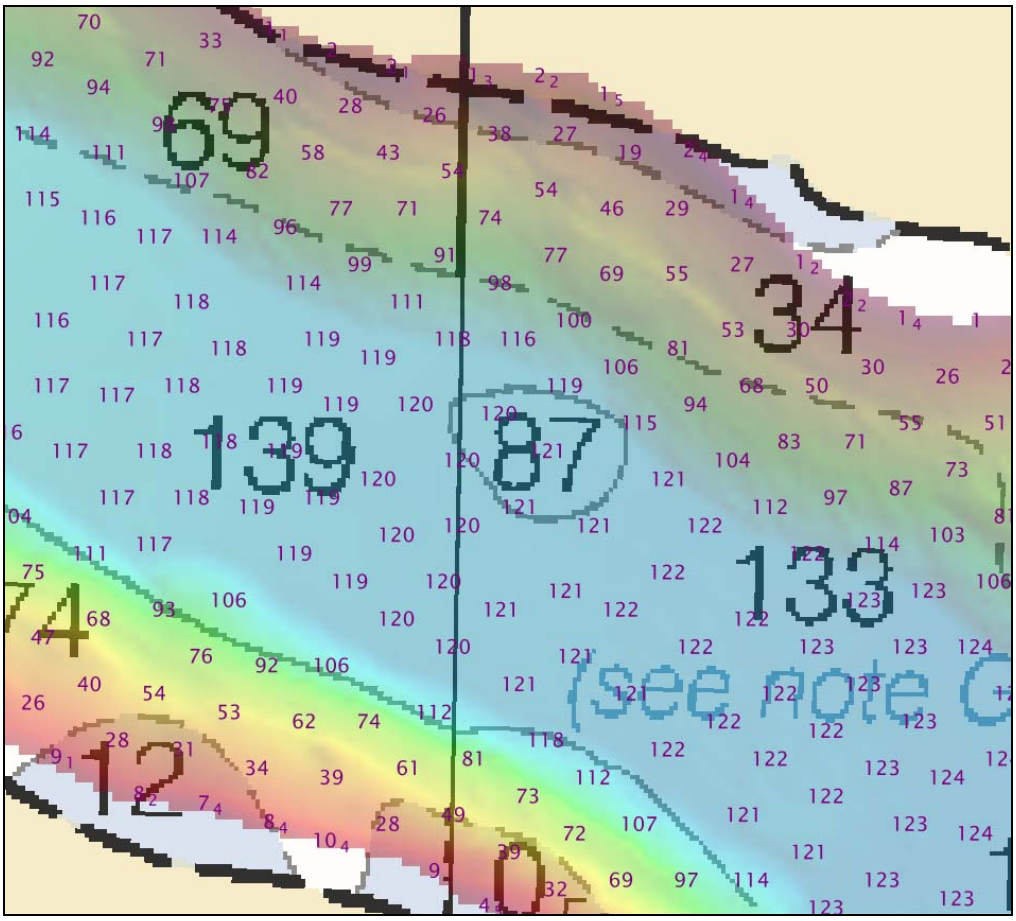

Figure 14: Increased Depths in Muir Inlet

D.1.2. Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met; however, data accuracy is outside of specifications defined by the *HSSDM* over a considerable portion of the surveyed area. All MBES data were examined in Caris HIPS Subset Editor and are believed to accurately represent sounding and features. The surveyed soundings as processed and delivered are adequate to supersede prior surveys in their common areas.[22]

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

There were no AWOIS items located within the limits of H12144.[23]

D.3. Dangers to Navigation

Seven dangers to navigation were found and six were reported to the Marine Chart Division Nautical Data Branch on January 13, 2010, the seventh was reported June 11, 2010.[24] The DTONs for sheet H12144 were issued for the extreme shoaling at the heads of Wachusett Inlet and Muir Inlet, as well as shoaling near the entrance to Wachusett Inlet. The preliminary Danger to Navigation Reports are included in Appendix I.[25]

D.3.1. Shoreline Source

A composite source file (CSF) in .000 format from HSD's Operations Branch was provided with the Project Instructions. The original file was imported into CARIS Notebook, converted to a .hob file, clipped to the sheet limits, and named H12144_Original_Composite_Source.hob to be included with the deliverables. This file was copied and named H12144_Feature_File.hob to be utilized during field verification. Shoreline sources that were included in the composite source file for survey H12144 included Geographic Cell (GC), Digital Data (DD), and charted features from chart 17318, see Table 8. Additionally, features from the current editions of chart 17318 that were not depicted by the source shoreline data were digitized in CARIS Notebook with S-57 attribution into the H12144_Feature_File.hob file, to be displayed for field verification.

D.3.2. Shoreline Verification

Fairweather personnel were unable to conduct limited shoreline verification at times near predicted low water, as directed in the Project Instructions and section 3.5.5.3 of the FPM. Areas that required feature investigations were visited at the lowest stage of tide that was reasonably available. Detached positions (DPs) were acquired and edits to the daily field H12144_Feature_File_TRX_DnXXX.hob were recorded in CARIS Notebook and on paper DP forms and boat sheets. Scanned copies of the DP forms and boat sheets with field annotations are included in the digital Separates I folder.

Chart 17318 (1: 80,000) is the largest scale chart for the project area. A Mean High Water (MHW) Buffer line, offset 64 meters (0.8 mm at scale of 1:80,000) from the composite source MHW, was used during shoreline verification to determine the Navigable Area Limit Line (NALL). The NALL, that defines the inshore limit of multibeam acquisition, was determined in the field as the farthest off-shore of either the MHW buffer listed above, the 4-meter depth contour, or the inshore limit of safe navigation.

D.3.3. Shoreline Data Processing

Acquired and edited positions during shoreline verification operations were processed in CARIS Notebook. Features that required tide correction were processed using the Load Tide function in CARIS Notebook. Approved water levels were applied to tide correct features where appropriate.

New features and features requiring revision were given S57 attribution. As outlined in section 4.4.10 of the FPM, features were delineated, attributed and placed on either the survey edited H12144_Final_Feature_File.hob (compiled from the field daily files) or H12144_Disprovals.hob. Features not on the disprovals layer nor labeled with the survey source indication that were of an ambiguous nature or that required a field remark were flagged with a marker note for further clarification.

Source features collected or edited by the field have source indication (SORIND) and source date (SORDAT) attribute fields populated to reflect the survey number (US,US,survy,H12144) and final survey date 20091103. Unmodified source shoreline features were left with their original SORIND and SORDAT values. The SORIND/SORDAT information for shoreline features included in the final Notebook .hob files is included in Table 8.

Shoreline Source	SORIND	SORDAT
RSD	US, US,graph, GC10779	20040600
Chart	US,US,graph,chart 17318	20010113
Survey	US,US,survy,H12144	20091103

Table 8: SORIND/SORDAT Shoreline Features

D.4. Source Shoreline Changes, New Features and Charted Features

In accordance with section 4.4.10 of the FPM, field notes made by the Hydrographer were provided in the Remarks field for features and when appropriate and recommendations to the cartographer were included in the Recommendations field.

Items disproved by the Hydrographer and deemed to not be included in the H12144_Final_Feature_File .hob file were moved to the H12144_Disprovals .hob file.[26]

D.4.1. Shoreline Recommendations

The Hydrographer recommends that the shoreline depicted in the CARIS Notebook files and final sounding files supersede and complement shoreline information compiled on the CSF and charts.[27]

D.5. Aids to Navigation

There were no aids to navigation within the survey limits.[28]

D.6. Additional Recommendations

The accumulation of glacial sediment has resulted in significant shoaling near the extents of Muir Inlet and Wachusett Inlet. Generally, charted depths in these areas are greater than the actual observed depths. The Hydrographer believes that these are very dynamic bottoms and it is very likely that the extents of these inlets will continue to shoal as settlement of glacial silt continues. It is also recommended that mariners be made aware of the dynamic tendencies of these features through notations on the nautical chart.[29]

D.7. 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 2009	May 15, 2009	N/CS33
Data Acquisition and Processing Report 2009	Dec. 21, 2009	N/CS33
Horizontal and Vertical Control Report for OPR-O351-FA-09	May 28, 2010	N/CS33
Tides and Water Levels Package for OPR-O351-FA-09	Nov. 20, 2009	N/OPS1
Coast Pilot Report for OPR-O351-FA-09	TBD	N/CS26

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

June 15, 2010

MEMORANDUM FOR: LCDR Richard T. Brennan, NOAA
Chief, Atlantic Hydrographic Branch

FROM: CAPT David O. Neander, NOAA
Commanding Officer

David O. Neander
2010.06.17
08:53:51 -07'00'

TITLE: Approval of Hydrographic Survey H12144,
OPR-O351-FA-09

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H12144 in accordance with the Hydrographic Manual, Fourth Edition; Field Procedures Manual, April 2009; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2009. 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/CS33, Atlantic 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:

Digitally signed by David Francksen
DN: cn=David Francksen, o=NOAA, ou=NOAA Ship FAIRWEATHER, email=David.Francksen@noaa.gov, c=US
Date: 2010.06.15 17:20:02 Z

ST David T. Francksen
Survey Manager

Briana Welton
I have reviewed this document
2010.06.17 15:26:18 Z

LT Briana J. Welton
Field Operations Officer

Briana Welton
I have reviewed this document
2010.06.17 15:26:39 Z

CST Lynnette V. Morgan
Chief Survey Technician

Attachment

Revisions and Corrections Compiled During Office Processing and Certification

[1] Concur. Higher differences in areas of steep sloping bottom topography is expected and has been deemed acceptable.
[2] A common coverage junction was made with H12143. A common junction with the bathymetry and features will be made when H12143 is compiled.
[3] Concur.
[4] The differences due to bottom detection and sound speed errors in 300m of water are not navigationally significant and therefore acceptable.
[5] Concur.
[6] The data from the lines with "fixed" TrueHeave files applied are acceptable and show no evidence of heave errors.
[7] Concur. The data is adequate for charting.
[8] Concur with clarification. One charted bottom sample was blue noted to be removed because it was clear from the BASE surface that the general bottom relief in the area was not rocky in nature.
[9] Concur. All the DTONs have been applied to the chart and all are addressed in the HCell.
[10] Concur. The data is adequate for charting.
[11] Higher uncertainties in areas of steep sloping bottom topography is expected and has been deemed acceptable.
[12] Concur.
[13] A 16-meter combined surface created during the SAR was used as the basis for compilation.
[14] See attached correspondence.
[15] Concur.
[16] See attached Tide Note dated March 26, 2010.
[17] H12144 was submitted to Pacific Hydrographic Branch for review and compilation.
[18] Concur.
[19] Concur. Chart shoaler depths as depicted in the HCell.
[20] Concur.
[21] Concur. It is recommended that the latest GC shoreline be used to update the chart as is shows good agreement with the bathymetry extents of H12144.
[22] Concur.
[23] Concur.
[24] All the DTONs have been applied to the chart and all are addressed in the HCell.
[25] See attached DTON reports and supplemental correspondence regarding application of the DTONs to the chart.
[26] The submitted hob files were used in the compilation of HCell H12144.
[27] Concur with clarification. The shoreline files were applied as appropriate to chart scale and with regard to correct and logical attribution. Three rocks submitted by the field at the following locations were attributed with VALSOUs that would have made them islets:

58-54-50.37N, 136-06-29.09W
58-55-58.32N, 136-12-58.58W
58-55-59.19N, 136-12-54.96W

Upon examining the areas in satellite imagery, there is no evidence of islets at those locations. The charted rocks in those areas were imported from the ENC to be retained as the VALSOUs acquired by leveling appear to be unreliable. Chart features as depicted in the HCell.
[28] Concur.
[29] Concur. It is recommended that a note indicating the dynamic nature of the area be added to the chart. See general blue notes in the HCell.

H12144 Danger to Navigation Report

Registry Number: H12144

State: Alaska

Locality: Glacier Bay National Park

Sub-locality: Northern Extent of Muir Inlet to Wachusett Inlet

Project Number: OPR-O351-FA-09

Survey Dates: Oct 22, 2009 - Nov 3, 2009

The terminations of both Muir and Wachsett Inlet have filled significantly. One shoal sounding in Muir Inlet and five shoal soundings in Wachusett Inlet have been selected for this report. In addition, contour and sounding files in .000 format of each area are submitted with this report. Verified tides with preliminary zoning are applied to these data.

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17318	7th	03/01/2009	1:80,000 (17318_1)	USCG LNM: 05/19/2009 (08/11/2009) CHS NTM: None (07/31/2009) NGA NTM: 07/14/2001 (08/22/2009)
17300	31st	09/01/2005	1:209,978 (17300_1)	[L]NTM: ?
16760	10th	11/18/2000	1:300,000 (16760_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

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

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	938/200	Shoal	14.77 m	58° 59' 03.8" N	136° 24' 17.2" W	---
1.2	1194/66	Shoal	0.35 m	59° 05' 25.7" N	136° 22' 33.8" W	---
1.3	626/486	Shoal	3.34 m	58° 59' 24.4" N	136° 24' 30.1" W	---
1.4	1588/43	Shoal	2.37 m	58° 59' 13.7" N	136° 24' 40.0" W	---
1.5	107/261	Shoal	1.27 m	58° 59' 08.8" N	136° 24' 51.1" W	---

1.6	942/509	Shoal	2.30 m	58° 59' 08.1" N	136° 25' 05.2" W	---

1 - Danger To Navigation

1.1) 938/200

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 59' 03.8" N, 136° 24' 17.2" W
Least Depth:	14.77 m (= 48.47 ft = 8.079 fm = 8 fm 0.47 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.991 m ; **TVU (TPEv)** ±0.412 m
Timestamp:	2009-300.21:43:39.637 (10/27/2009)
Survey Line:	h12144 / 2802_rsn7125_400khz_512bms_2009 / 2009-300 / 2009e_3002141
Profile/Beam:	938/200
Charts Affected:	17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows depths significantly shoaler than charted depths.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_400khz_512bms_2009/2009-300/2009e_3002141	938/200	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

8fm (17300_1, 16760_1, 16016_1, 530_1)

8fm 0ft (17318_1, 531_1)

14.8m (500_1, 50_1)

Feature Images

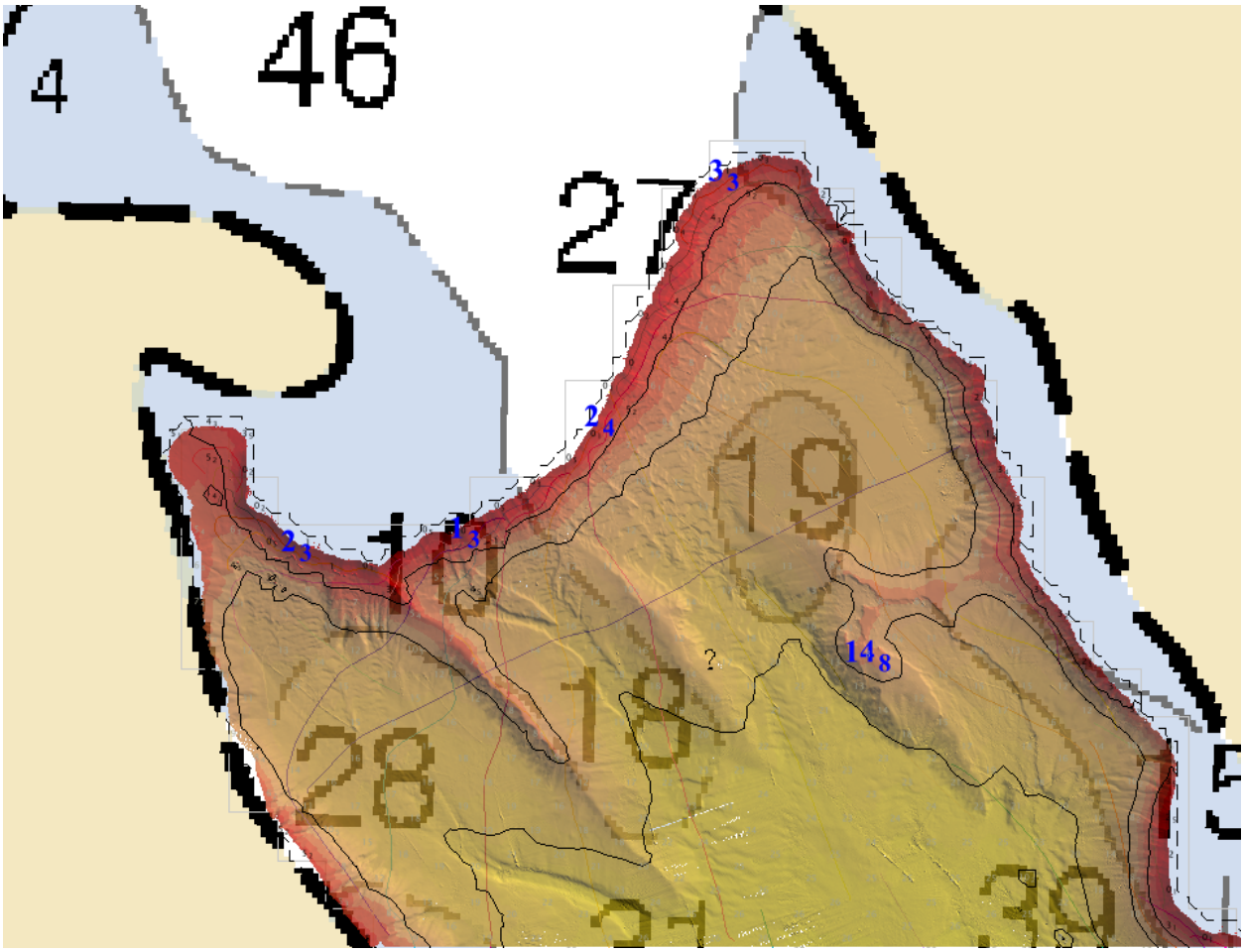

Figure 1.1.1

1.2) 1194/66

DANGER TO NAVIGATION

Survey Summary

Survey Position: 59° 05' 25.7" N, 136° 22' 33.8" W

Least Depth: 0.35 m (= 1.15 ft = 0.192 fm = 0 fm 1.15 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.982 m ; **TVU (TPEv)** ±0.410 m

Timestamp: 2009-301.21:20:34.116 (10/28/2009)

Survey Line: h12144 / 2801_rsn7125_200khz_256bms_2009 / 2009-301 / 2009e_3012116

Profile/Beam: 1194/66

Charts Affected: 17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows shaoling at the termination of Muir Inlet.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2801_rsn7125_200khz_256bms_2009/2009-301/2009e_3012116	1194/66	0.00	000.0	Primary

Hydrographer Recommendations

Update soundings and contours using attached sounding and contour .000 files.

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17300_1, 16760_1, 16016_1, 530_1)

0fm 1ft (17318_1, 531_1)

.4m (500_1, 50_1)

Feature Images

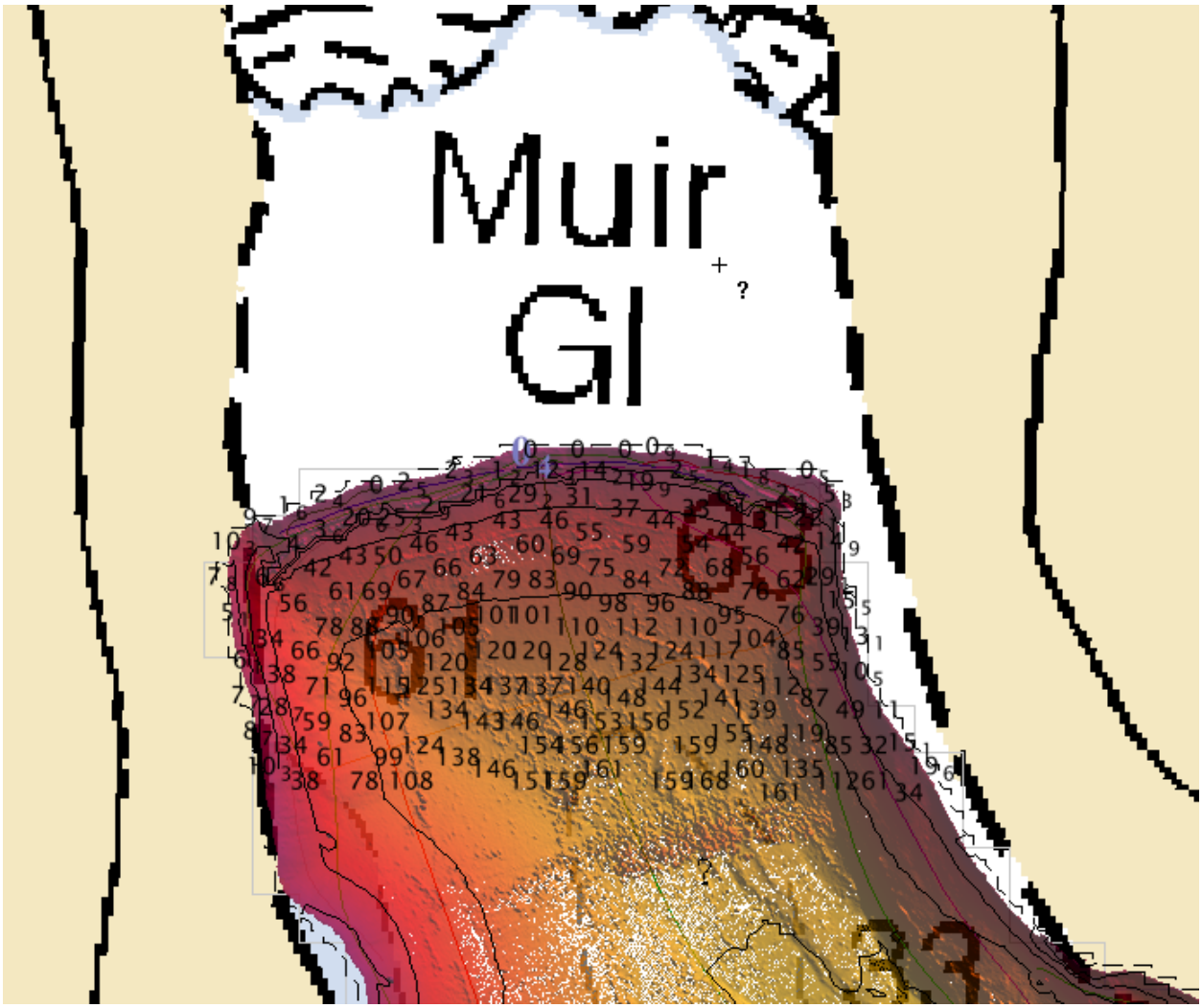

Figure 1.2.1

1.3) 626/486

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 59' 24.4" N, 136° 24' 30.1" W
Least Depth:	3.34 m (= 10.95 ft = 1.825 fm = 1 fm 4.95 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.984 m ; **TVU (TPEv)** ±0.414 m
Timestamp:	2009-300.22:11:02.299 (10/27/2009)
Survey Line:	h12144 / 2802_rsn7125_400khz_512bms_2009 / 2009-300 / 2009e_3002210
Profile/Beam:	626/486
Charts Affected:	17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows depths significantly shoaler than charted depths.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_400khz_512bms_2009/2009-300/2009e_3002210	626/486	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (17300_1, 16760_1, 16016_1, 530_1)

1fm 5ft (17318_1, 531_1)

3.3m (500_1, 50_1)

Feature Images

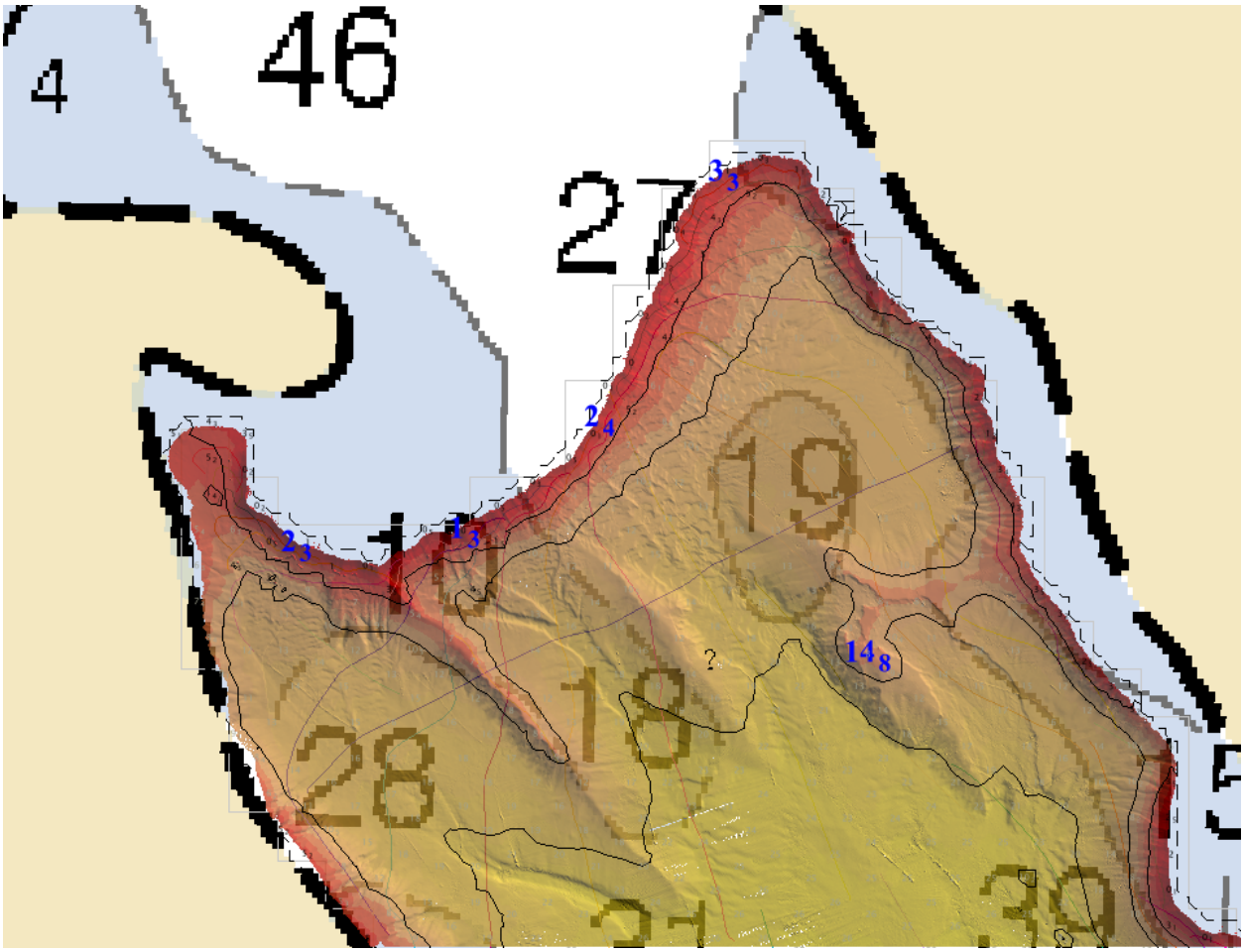

Figure 1.3.1

1.4) 1588/43

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 59' 13.7" N, 136° 24' 40.0" W
Least Depth:	2.37 m (= 7.78 ft = 1.296 fm = 1 fm 1.78 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.982 m ; **TVU (TPEv)** ±0.412 m
Timestamp:	2009-300.22:20:38.402 (10/27/2009)
Survey Line:	h12144 / 2802_rsn7125_400khz_512bms_2009 / 2009-300 / 2009e_3002216
Profile/Beam:	1588/43
Charts Affected:	17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows depths significantly shoaler than charted depths.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_400khz_512bms_2009/2009-300/2009e_3002216	1588/43	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (17300_1, 16760_1, 16016_1, 530_1)

1fm 2ft (17318_1, 531_1)

2.4m (500_1, 50_1)

Feature Images

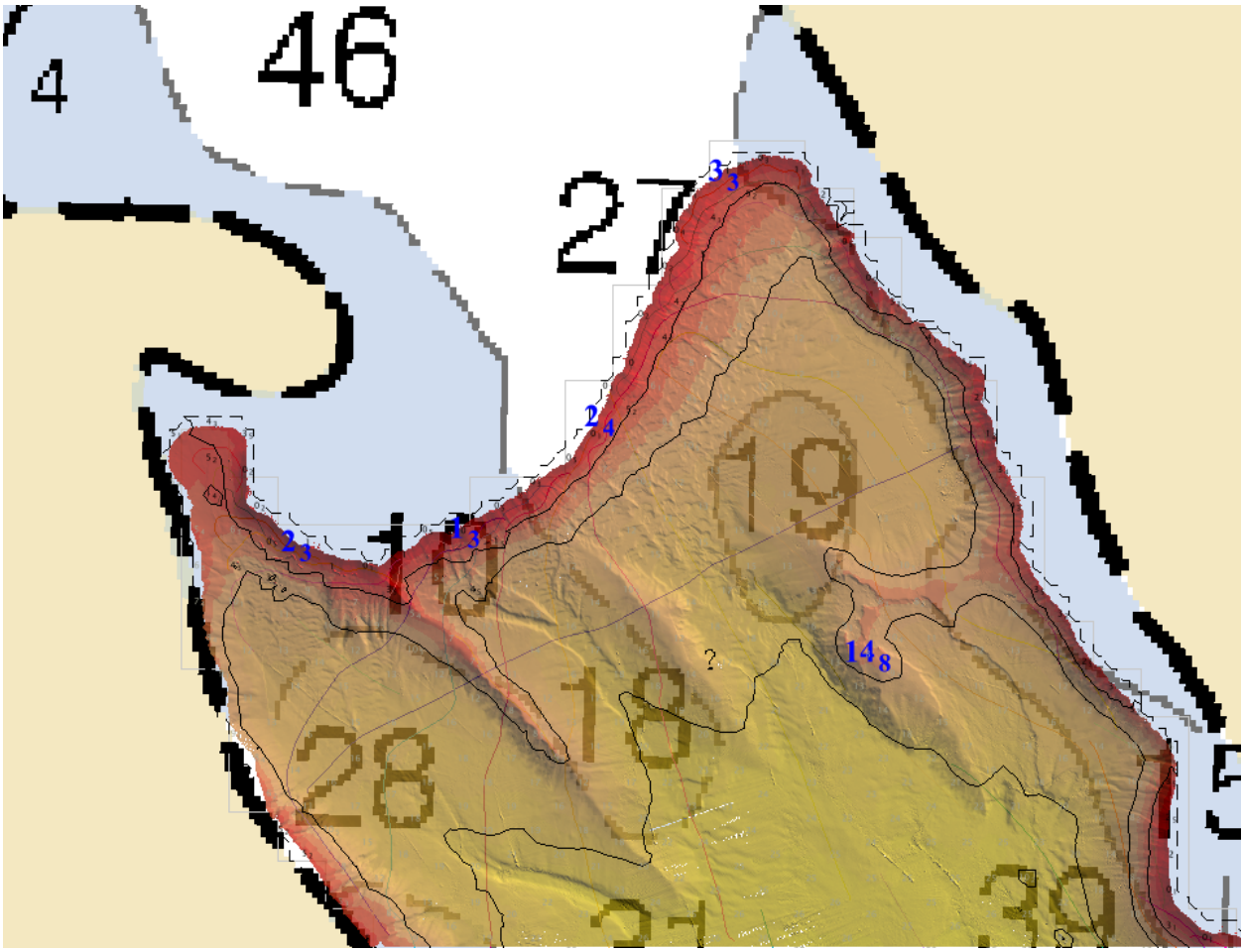

Figure 1.4.1

1.5) 107/261

DANGER TO NAVIGATION

Survey Summary

Survey Position: 58° 59' 08.8" N, 136° 24' 51.1" W

Least Depth: 1.27 m (= 4.15 ft = 0.692 fm = 0 fm 4.15 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.982 m ; **TVU (TPEv)** ±0.410 m

Timestamp: 2009-300.22:39:38.185 (10/27/2009)

Survey Line: h12144 / 2802_rsn7125_400khz_512bms_2009 / 2009-300 / 2009e_3002239

Profile/Beam: 107/261

Charts Affected: 17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows depths significantly shoaler than charted depths.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_400khz_512bms_2009/2009-300/2009e_3002239	107/261	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

0 ¾fm (17300_1, 16760_1, 16016_1, 530_1)

0fm 4ft (17318_1, 531_1)

1.3m (500_1, 50_1)

Feature Images

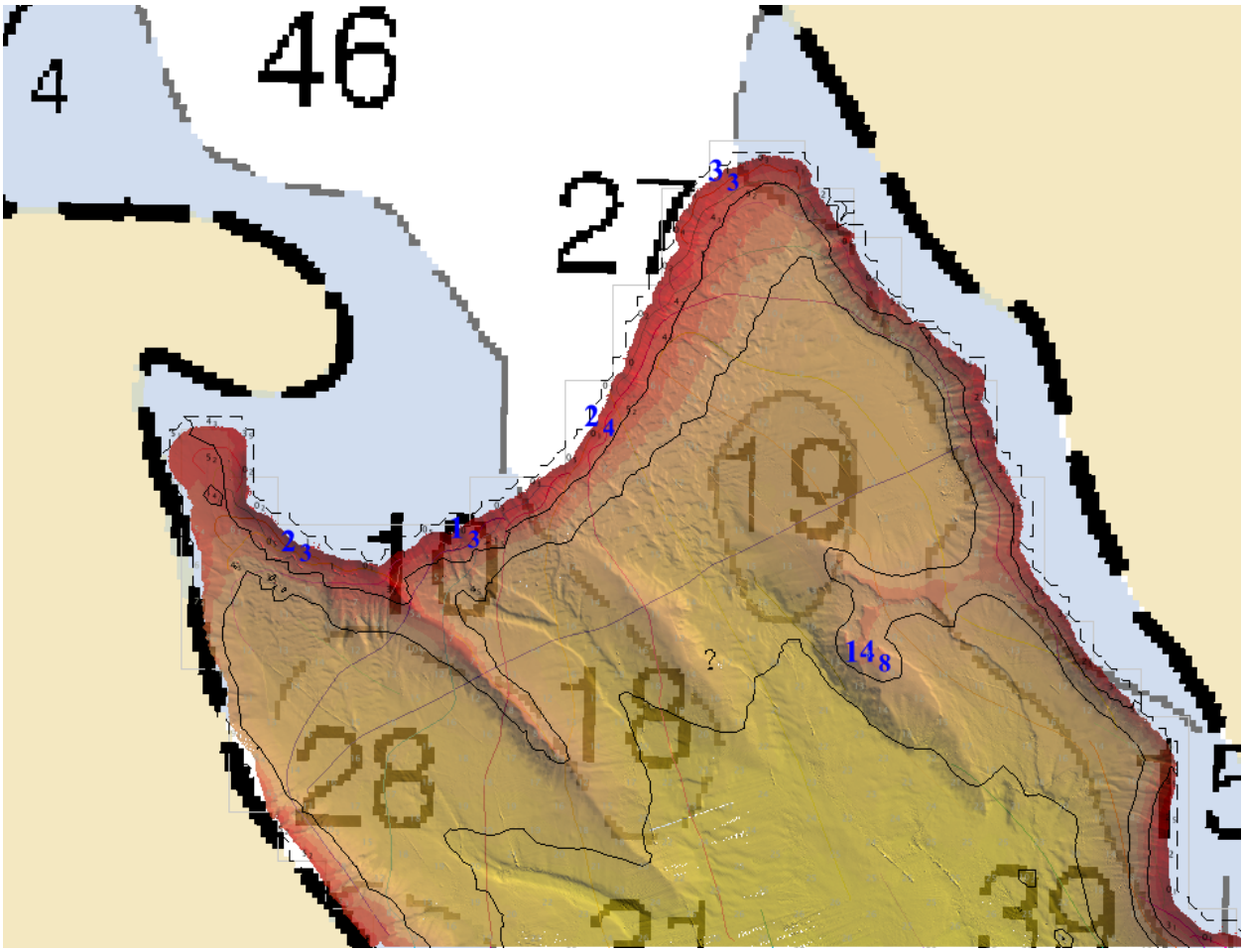

Figure 1.5.1

1.6) 942/509

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 59' 08.1" N, 136° 25' 05.2" W
Least Depth:	2.30 m (= 7.56 ft = 1.260 fm = 1 fm 1.56 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.983 m ; **TVU (TPEv)** ±0.413 m
Timestamp:	2009-300.22:45:56.094 (10/27/2009)
Survey Line:	h12144 / 2802_rsn7125_400khz_512bms_2009 / 2009-300 / 2009e_3002244
Profile/Beam:	942/509
Charts Affected:	17318_1, 17300_1, 16760_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Complete MBES coverage of area shows depths significantly shoaler than charted depths.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_400khz_512bms_2009/2009-300/2009e_3002244	942/509	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1 ¼fm (17300_1, 16760_1, 16016_1, 530_1)

1fm 1ft (17318_1, 531_1)

2.3m (500_1, 50_1)

Feature Images

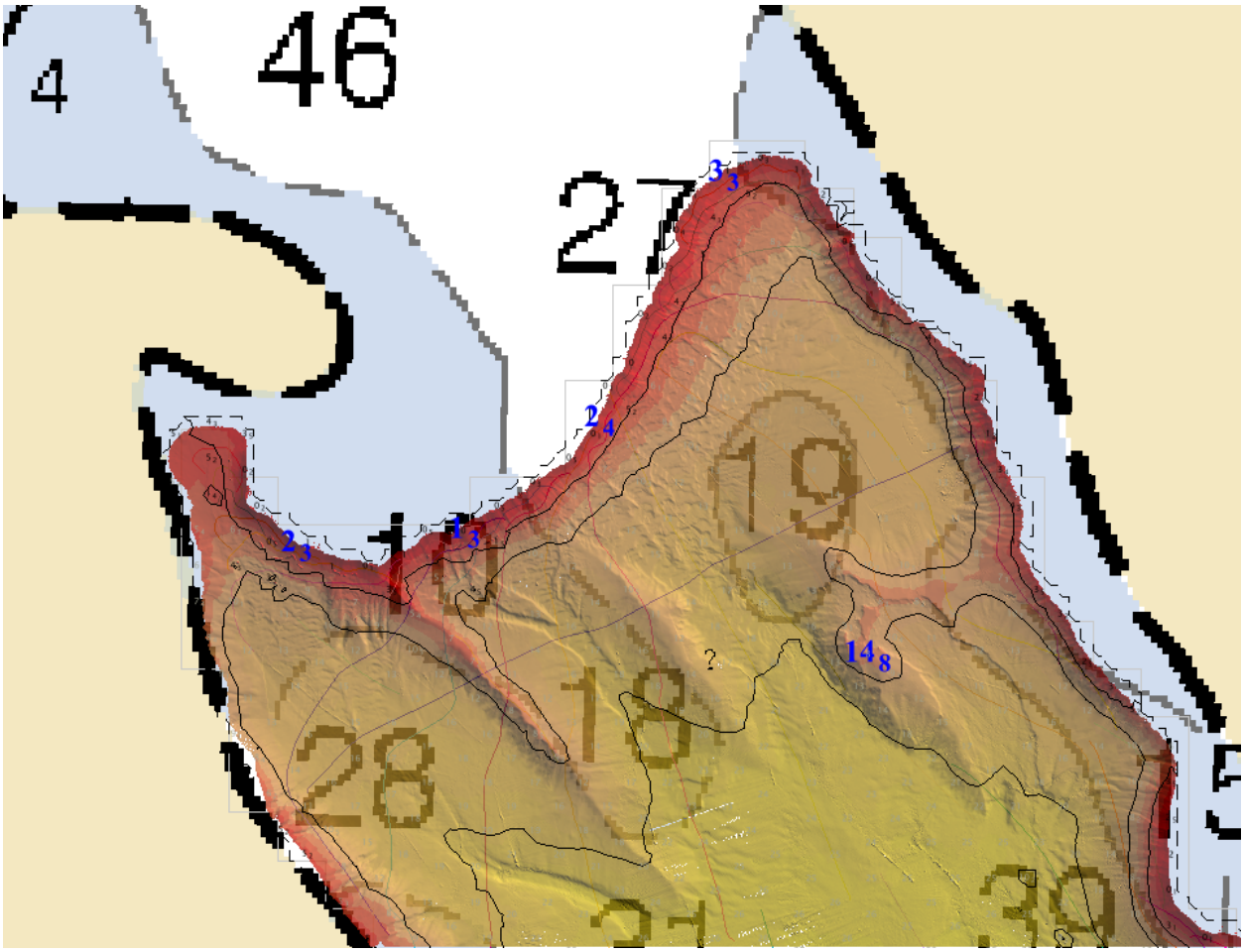

Figure 1.6.1

H12144 Danger to Navigation Report #2

Registry Number: H12144
State: Alaska
Locality: Glacier Bay National Park
Sub-locality: Northern Extent of Muir Inlet to Wachusett Inlet
Project Number: OPR-O351-FA-09
Survey Dates: Oct 22, 2009 - Nov 3, 2009

New least depth on charted shoal area.

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17318	7th	03/01/2009	1:80,000 (17318_1)	USCG LNM: 05/19/2009 (08/11/2009) CHS NTM: None (07/31/2009) NGA NTM: 07/14/2001 (08/22/2009)
17300	31st	09/01/2005	1:209,978 (17300_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

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

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	570/225	Rock	3.12 m	58° 56' 44.2" N	136° 08' 08.2" W	---

1 - Danger To Navigation

1.1) 570/225

DANGER TO NAVIGATION

Survey Summary

Survey Position:	58° 56' 44.2" N, 136° 08' 08.2" W
Least Depth:	3.12 m (= 10.24 ft = 1.707 fm = 1 fm 4.24 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.093 m ; **TVU (TPEv)** ±0.399 m
Timestamp:	2009-299.17:43:58.402 (10/26/2009)
Survey Line:	h12144 / 2802_rsn7125_200khz_256bms_2009 / 2009-299 / 2009e_2991742
Profile/Beam:	570/225
Charts Affected:	17318_1, 17300_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

New least depth on charted shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12144/2802_rsn7125_200khz_256bms_2009/2009-299/2009e_2991742	570/225	0.00	000.0	Primary

Hydrographer Recommendations

Chart shoal sounding on rock.

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (17300_1, 16016_1, 530_1)

1fm 4ft (17318_1, 531_1)

3.1m (500_1, 50_1)

Feature Images

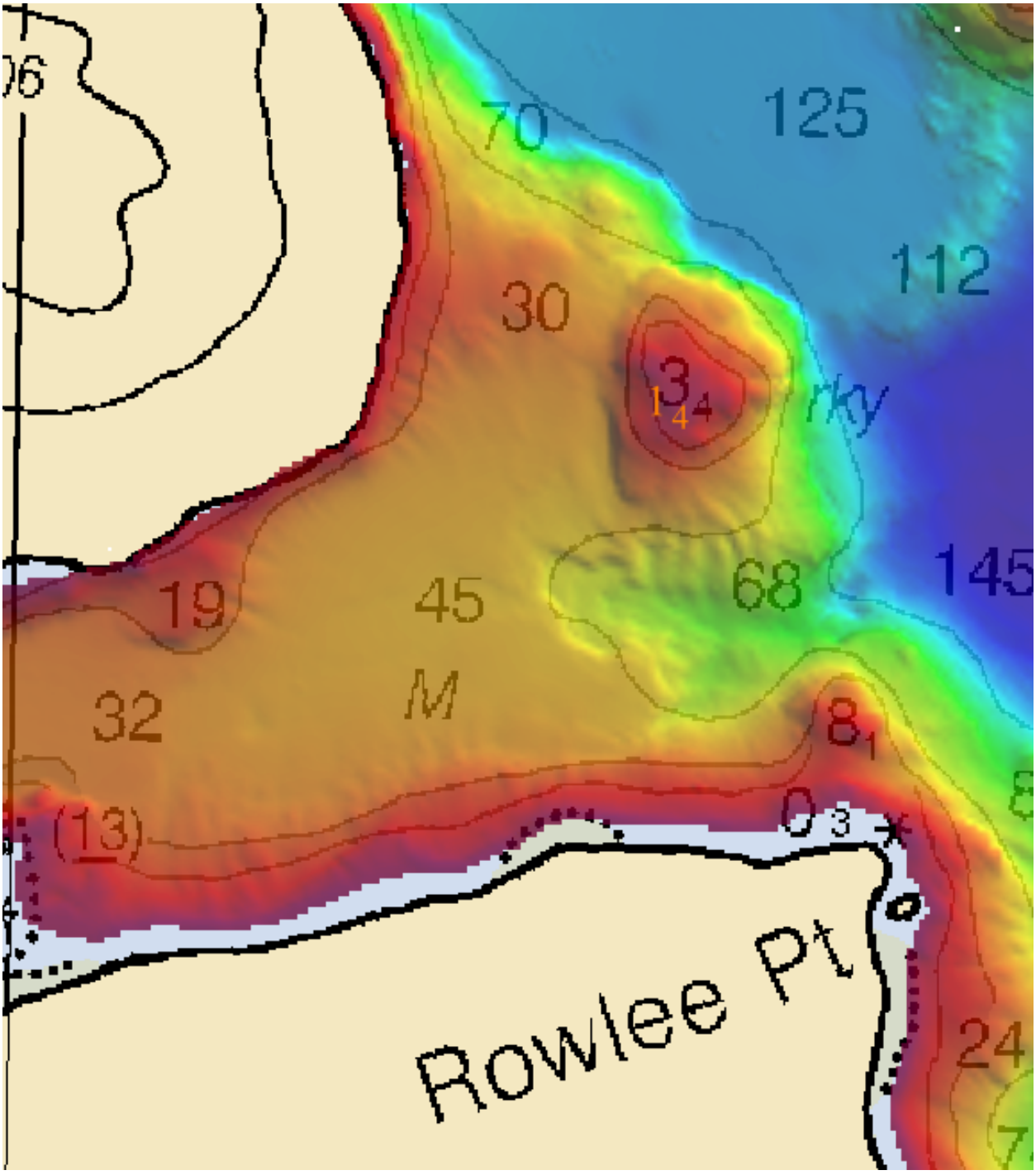

Figure 1.1.1

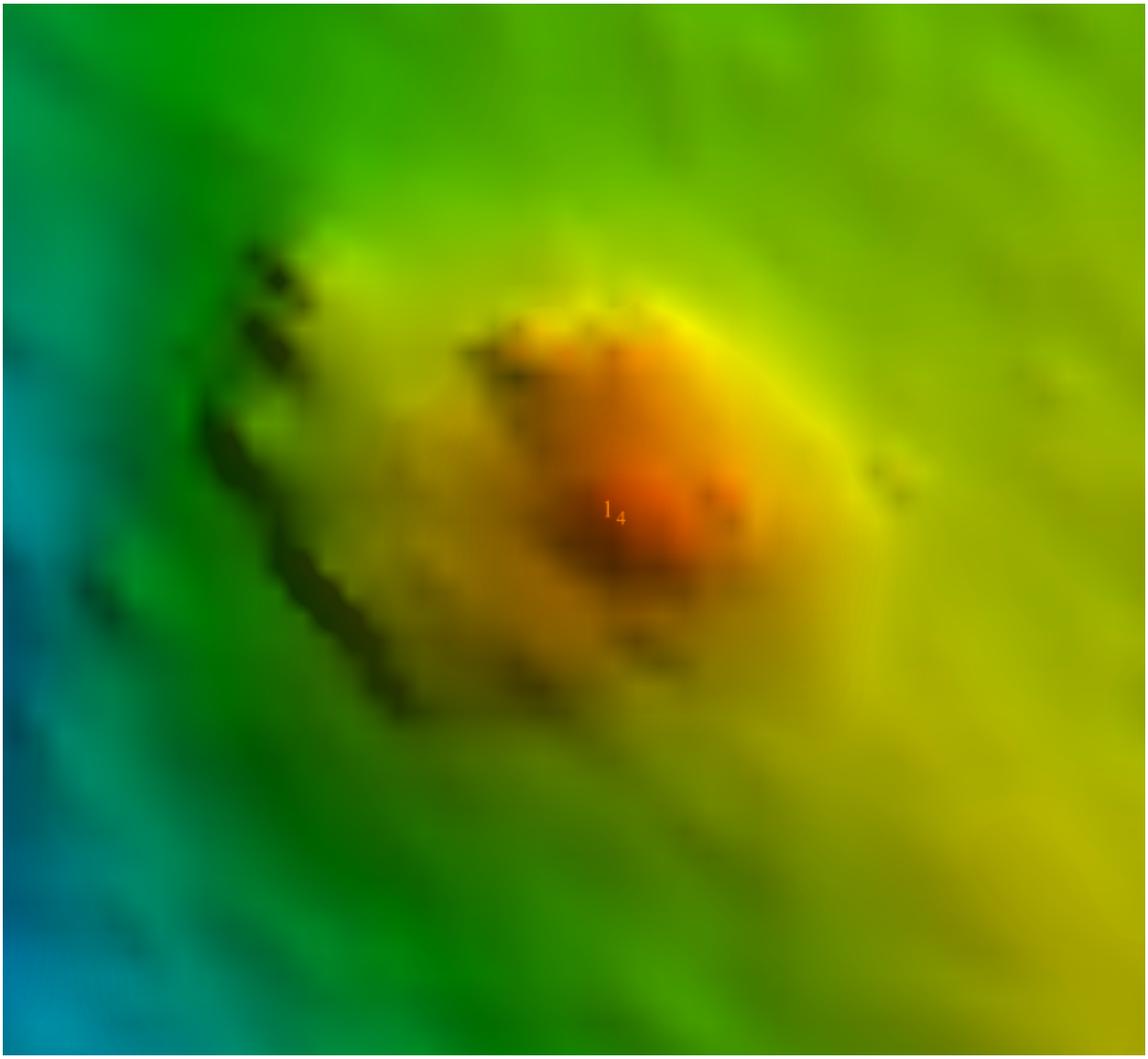

Figure 1.1.2

FOID	Type	Acronym	Latitude	Longitude	userid	remrks	SORIND	SORDAT	WATLEV	VALSOU	obsdpt	obstim	tidadj	tidfil	QUASOU	TECSOU	NATSUR	INFORM	SCAMIN	EXPSOU	VALDCO
US 0000001837 00001	Line	SBDARE				new ext GC (10779) ldg	US,US,survy,H12144	20091103	4			20100527T223442					9				
US 0000000257 00001	Point	UWTROC	58-54.83N	136-06.55W	130701	new pos chd (17318) rk	US,US,survy,H12144	20091103			-2.8	-2 20091103T171245	0.8	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf	1	12					
0_ 1252010560 00002	Line	OBSTRN				new exts GC (10779) reef	US,US,survy,H12144	20091103	4									Reef			
1C 0000003061 00001	Point	UWTROC	58-55.95N	136-13.25W	229901	new rk	US,US,survy,H12144	20091103			-1.7	0 20091027T233508	1.7	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf	1	12					
US 0000003177 00001	Line	OBSTRN				new extent chd (17318) foul area	US,US,survy,H12144	20091103				20100605T015244									
0_ 1252010552 00049	Point	UWTROC	58-55.97N	136-12.98W	130706	chd (17318) rk is hp GC (10779) reef	US,US,survy,H12144	20091103	4	-6.7	-2	20091103T112152	4.7	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf	1	12	9		239999		
US 0000001842 00001	Line	SBDARE				new exts GC (10779) reef	US,US,survy,H12144	20091103													
0_ 1252010552 00048	Point	UWTROC	58-55.99N	136-12.92W	130707	chd (17318) rk is hp GC (10779) reef	US,US,survy,H12144	20091103	4	-7.8	-3.2	20091103T113010	4.6	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf	1	12	9		239999		
0_ 1252010552 00139	Point	UWTROC	58-55.96N	136-10.02W		chd (17318) rk connected at LW	US,US,survy,H12144	20091103	4	-0.6					6		9		319999	2	
0_ 1252010549 00050	Area	OBSTRN				new ext chd (17318) foul area	US,US,survy,H12144	20091103	3						2				350000		
US 0000001851 00001	Line	DEPCNT				new ext chd (17318) MLLW	US,US,survy,H12144	20091103													
US 0000001847 00001	Line	DEPCNT				new ext chd (17318) MLLW	US,US,survy,H12144	20091103				20100527T225342									0
0_ 1252010552 00138	Point	UWTROC	58-54.84N	136-06.48W	130702	chd (17318) rk dp ht	US,US,survy,H12144	20091103	4	-6.9	-2	20091103T101807	4.9	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf	6	12	9		319999	2	
US 0000003167 00001	Area	SBDARE				chd (17318) rk is ext ldg	US,US,survy,H12144	20091103	4			20100604T131805					9				
US 0000003176 00001	Area	SBDARE			130704	new reef exts	US,US,survy,H12144	20091103	4		-3	20091103T105926	4.8	I:\2009_Processed_Data\Tide\OPR_O351_FA_09\Final_Tides\H12144\9452584_Muir_Inlet and 9452632_Wachusett_Inlet\H12144CORF.zdf			9				

From: "ocs.ndb" <OCS.NDB@noaa.gov>
To: <Crescent.Moegling@noaa.gov>
Cc: "Kurt Mueller" <Kurt.Mueller@noaa.gov>; "Tara Wallace" <Tara.Wallace@noaa.gov>
Sent: Friday, April 22, 2011 10:26 AM
Subject: Re: Chart 17318 major discrepancy

Crescent,

Good afternoon. I don't know if a resolution was achieved; I forwarded your question to higher authority in MCD.

Lance

On 4/22/2011 12:24 PM, Crescent Moegling wrote:

> Was there ever a resolution to this FA DTON issue?
>
> On 4/12/2011 5:43 AM, ocs.ndb wrote:
>
> > Kurt,
> >
> > Good morning. We will conduct research on this and provide feedback.
> >
> > Lance Roddy
> > Cartographer
> > Nautical Data Branch
> > Marine Chart Division, NOAA
> > 301-713-2737 ext. 126
> >
> > On 4/11/2011 7:46 PM, Kurt Mueller wrote:
> >
> > > Hello,
> > >
> > > I've found a major discrepancy on Chart 17318 while reviewing survey H12144 (OPR-O351-FA-09). These were DTONS that were submitted by Fairweather back in January of 2010. It appears that only a few soundings from the DTON report were applied to the chart at the heads of Wachusett and Muir Inlets, and the contour lines were drawn incorrectly or incompletely.
> > >
> > > I've attached a zip file containing the original report, email, and several .000 files containing the surveyed soundings and contours. Also included are two .jpg images showing the surveyed soundings overlaid on the newest edition of chart 17318.
> > >
> > > Please let me know if you have any questions or require additional

data in order to correct the chart.

Thanks,

Kurt

--
Kurt Mueller

Pacific Hydrographic Branch
NOAA Office of Coast Survey

--
Crescent Moegling
Hydrographic Team Lead
Pacific Hydrographic Branch
206.526.6840

Subject:
Re: Reson 7111 device model
From:
Corey Collins <corey.collins@caris.com>
Date:
Thu, 21 Jan 2010 14:41:14 -0400
To:
Eric Maillard <Eric.Maillard@reson.com>
CC:
foo fairweather <FOO.Fairweather@noaa.gov>, "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, Edward.J.Vandenameele@noaa.gov, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>, Jeremy Nicholson <jeremy.nicholson@caris.com>

Hi Eric,

Thanks for the prompt replay and I will go ahead and get this fixed up in our software as soon as possible.

Regards,
Corey

-------- Original Message --------
Subject: Re: Reson 7111 device model
From: Eric Maillard <Eric.Maillard@reson.com>
To: Corey Collins <corey.collins@caris.com>, foo fairweather <FOO.Fairweather@noaa.gov>
Cc: "glen.rice" <Glen.Rice@noaa.gov>, "Brett Evans" <Brett.Evans@reson.com>, "Michael Mutschler" <Michael.Mutschler@reson.com>, "chiefst Fairweather" <ChiefST.Fairweather@noaa.gov>, "Jack Riley" <Jack.Riley@noaa.gov>, Edward.J.Vandenameele@noaa.gov, "Olivia Hauser" <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, "LCDR Rick Brennan NOAA" <Richard.T.Brennan@noaa.gov>, "Jeremy Nicholson" <jeremy.nicholson@caris.com>
Date: Thursday, January 21, 2010 2:39:31 PM
>
> Hi Corey,
>
>
>
> Yes, you should be using the same algorithm for 8111 and 7111.
>
>
>
> Thanks for looking into that,
>
> Eric
>
>
>
> From: Corey Collins [mailto:corey.collins@caris.com]
> Sent: Thursday, January 21, 2010 8:24 AM
> To: foo fairweather; Eric Maillard
> Cc: glen.rice; Brett Evans; Michael Mutschler; chiefst Fairweather; Jack Riley; Edward.J.Vandenameele@noaa.gov; Olivia Hauser; caryn.arnold; LCDR Rick Brennan NOAA; Jeremy Nicholson
> Subject: Re: Reson 7111 device model

>
>
>
> All,
>
> I think we have quickly gotten to the bottom of this. First a little background information on how the TPU algorithms are implemented in HIPS and SIPS. We initially received from UNH a list of devices that specific algorithms had been developed for. We implemented those and tagged specific device models from the devicemodels.xml file in HIPS to the pertinent TPU algorithms provided from UNH. Since receiving these algorithms a lot of clients have requested to be able to compute TPU for sonars not contained in the group of sonars as tested and studied by UNH. So what we have done in order to accommodate these clients, as we do not have access to specific sonars to test and develop algorithms for, we have added device models to the devicemodels.xml file and then used a set of generic TPU algorithms for those sonars. So after digging in regards to this situation with the 8111 and the 7111 on our end this is what we have discovered.
>
> The 8111 was indeed part of the original TPU algorithms provided to us by UNH and therefore it has specific algorithms that are being called and used. The 7111 was not in that list so we are using the generic TPU algorithms as described for Swath Sonars. So with that said, my question to Reson is, should we be using the same algorithms for the 7111 as we are using for the 8111?
>
> I apologize for not thinking of this beforehand, but if Reson confirms that we should be using the same algorithms as with the 8111 then we can have this fixed up very quickly.
>
> Regards,
> Corey
>
> -------- Original Message --------
> Subject: Re: Reson 7111 device model
> From: Corey Collins <corey.collins@caris.com>
> To: foo fairweather <FOO.Fairweather@noaa.gov>
> Cc: Eric Maillard <Eric.Maillard@reson.com>, "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, "Edward.J.Vandenameele@noaa.gov" <Edward.J.Vandenameele@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>
> Date: Thursday, January 21, 2010 12:05:23 PM
>
> Hi Bri,
>
> We are looking now on our end as I think there is something amiss in our software. I hope to have feedback to provide on this next week at FPW. So as you put it below, I think this may be something silly and should be easy to fix on our end.
>
> Corey
>
> -------- Original Message --------
> Subject: Re: Reson 7111 device model
> From: foo fairweather <FOO.Fairweather@noaa.gov>
> To: Eric Maillard <Eric.Maillard@reson.com>
> Cc: "glen.rice" <Glen.Rice@noaa.gov>, Brett Evans <Brett.Evans@reson.com>, Michael Mutschler <Michael.Mutschler@reson.com>, Corey Collins <corey.collins@caris.com>, chiefst Fairweather <ChiefST.Fairweather@noaa.gov>, Jack Riley <Jack.Riley@noaa.gov>, "Edward.J.Vandenameele@noaa.gov" <Edward.J.Vandenameele@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, "caryn.arnold" <Caryn.Arnold@noaa.gov>, LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>

> Date: Wednesday, January 20, 2010 4:25:08 PM
>
> Hi Eric,
>
> I tried these values and the uncertainty actually increased slightly.
>
> Jack,
>
> I've attached our device model file with the values Eric suggested and our 7111 hvf for your review.
>
> All (HSTP, Reson, Caris),
>
> I'm at a loss as to what is going on with the 7111 uncertainty. Glen sent me some theoretical background material on device model creation but I honestly don't have time to digest it. Jack has agreed to come over to the ship on Monday while he's here in Seattle for FPW to noodle around. In the meantime, let us know if you think of something. Hopefully this is something simple and silly that can be fixed easily.
>
> Many thanks,
>
> Bri
>
>
>
>
> On 1/15/2010 10:43 AM, Eric Maillard wrote:
>
> Hi Bri,
>
>
>
> I cannot figure out the problem with the model except in 301 beam mode.
>
> <Steering_Angle value="0" /> should be <Steering_Angle value="90" /> because it is a cylindrical array so the steering in equi-distant does not affect the beam width much.
>
>
>
>
>
> The other point I am not so sure about anymore is:
>
> <Range_Sampling_Distance value="0.124" />
>
>
>
> I compare this value to that of other systems and it seems that the relationship between this value and the sampling rate is not always as I would expect. If this parameter is supposed to represent the bottom detection sampling rate then a value similar to the 8111 is more accurate. It should read:
>
> <Range_Sampling_Distance value="0.031" />
>
> For all version of the 7111.
>
>

>
> If the above mentioned changes don’t bring the uncertainty to a level compatible with the true performances of the system, we will have to start questioning the model itself.
>
>
>
> Hope this helps,
>
> Eric
>
>
>
> From: foo fairweather [mailto:FOO.Fairweather@noaa.gov]
> Sent: Tuesday, January 12, 2010 3:08 PM
> To: Eric Maillard
> Cc: glen.rice; Brett Evans; Michael Mutschler; Corey Collins; chiefst Fairweather
> Subject: Reson 7111 device model
>
>
>
> Hi Eric,
>
> Attached is the current device model that we're using. I believe this is the second iteration of it. We're still seeing relatively high uncertainty values with the 7111 (outside of IHO tolerances) The attached color maps is:
> 0-2 meters is green
> 2-4 meters is yellow
> 4-10 meters is red
> and the yellow lines that are selected are 7111 lines.
>
> Thanks,
>
> Bri
>
>
>
>
>
> -------- Original Message --------
>
> Subject:
>
>
> [Fwd: Re: Reson 8125 and 7111 manuals]
>
> Date:
>
>
> Tue, 03 Nov 2009 09:01:01 -0900
>
> From:
>
>
> foo.fairweather <foo.fairweather@noaa.gov>
>

> To:
>
>
> Brett Evans <Brett.Evans@reson.com>
>
>
> Hi Brett,
>
> This is the original email thread. I didn't originally type your
> correct email address.
>
> Thanks,
>
> Bri
>
> --
> LT Briana Welton
> Field Operations Officer
> NOAA Ship Fairweather
> 1010 Stedman St
> Ketchikan, AK 99901
> 907-254-2842 (ship's cell)
> 808-659-0054 (ship's sat)
>
>
>
>
>
>
>
> --
> LT Briana Welton
> Field Operations Officer
> NOAA Ship Fairweather
> 1010 Stedman St
> Ketchikan, AK 99901
> 907-254-2842 (ship's cell)
> 808-659-0054 (ship's sat)
>
> Fairweather communications are often unreliable. If you suspect email is not going to or from the foo.fairweather
> email account, try emailing briana.welton@noaa.gov or calling me on my personal cell at 520-227-9269.
>
>
>
>
>
> --
> _____
> Corey M. Collins
> CARIS HIPS/SIPS/Notebook Product Manager
> CARIS
> 115 Waggoners Lane, Fredericton, New Brunswick, Canada, E3B 2L4
> Tel: +1.506.458.8533 Fax: +1.506.459.3849
> _____

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>
>
>
> --
> _____
> Corey M. Collins
> CARIS HIPS/SIPS/Notebook Product Manager
> CARIS
> 115 Waggoners Lane, Fredericton, New Brunswick, Canada, E3B 2L4
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--

_____
Corey M. Collins
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Tel: +1.506.458.8533 Fax: +1.506.459.3849

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Subject: RE: RMA#502584: Reson 7111 transceiver
From: Brett Evans <Brett.Evans@reson.com>
Date: Fri, 21 May 2010 16:13:54 -0700
To: Caryn Arnold <Caryn.Arnold@noaa.gov>, "ops.fairweather" <ops.fairweather@noaa.gov>, Larry Loewen <Larry.Loewen@noaa.gov>
CC: Jim Lynn <Jim.Lynn@noaa.gov>, Olivia Hauser <Olivia.Hauser@noaa.gov>, chiefet fairweather <chiefet.fairweather@noaa.gov>, Matthew Jaskoski <matthew.jaskoski@noaa.gov>, Edward.J.Vandenameele@noaa.gov, _NMAO MOP XO Fairweather <xo.fairweather@noaa.gov>, Todd Irby <Todd.Irby@noaa.gov>, co fairweather <co.fairweather@noaa.gov>, Michael Mutschler <Michael.Mutschler@reson.com>, Eric Schug <Eric.Schug@reson.com>, Justin Friesner <Justin.Friesner@reson.com>

Dear Caryn, Bri and All,

We plan to send Eric Schug to Ketchikan this weekend. His contact info is as follows:

Eric Schug
Direct: +1-805-964-6271 ex 550
Cell: +1-805-708-0097
E-mail: eric.schug@reson.com

He plans to travel on Sunday May 23 with the repaired 7111 Txcvr, spare parts and tools. He is scheduled to arrive in Ketchikan at approximately 4PM.

He was able to get in a have the PPD Test started this afternoon.

As he is only going to be able to travel with one large item (the 7111 Txcvr) we will send the 7125-SV Processor (RMA#502555) and large white ship case for 7111 Txcvr Box to Larry Loewen's attention in Seattle before May 27.

Re: faults on 7111 Txcvr Box - we found the reported faults to be related to the following:

"Two of the Receiver Cards were faulty. The problem with the Transceiver was that one of the Receiver Boards was overloading the Gain control signal therefore limiting the Gain range. The reduced Gain range made it appear as though the Transmit Power was too low. When the Gain set to 83dB in the UI the effective gain was ~15dB. The Gain control is an analog signal that sets the Gain in all channels in parallel.

The Transceiver, running with our test wet-end and 7111 Processor Box for the last 24 hours, is working now."

Please let me know if you have any questions.

Regards,
Brett Evans
RESON Support

-----Original Message-----
From: Brett Evans
Sent: Thursday, May 20, 2010 1:33 PM
To: 'Caryn Arnold'; 'ops.fairweather'; 'Larry Loewen'
Cc: 'Jim Lynn'; 'Olivia Hauser'; 'chiefet fairweather'; 'Matthew Jaskoski'; 'Edward.J.Vandenameele@noaa.gov'; '_NMAO MOP XO Fairweather'; 'Todd Irby'; 'co fairweather'; Michael Mutschler; Justin Friesner; Eric Schug
Subject: RE: RMA#502584: Reson 7111 transceiver

Dear Caryn and All,

FYI, we received the Fairweather's 7111 Txcvr Box this morning.

We are working on it now and will send some more info on our findings shortly.

Regards,
Brett Evans
RESON Support

-----Original Message-----
From: Brett Evans
Sent: Wednesday, May 19, 2010 5:26 PM
To: 'Caryn Arnold'; ops.fairweather; 'Larry Loewen'
Cc: Jim Lynn; Olivia Hauser; chiefet fairweather; Matthew Jaskoski; Edward.J.Vandenameele@noaa.gov; _NMAO MOP XO Fairweather; 'Todd Irby'; co fairweather; Michael Mutschler; Justin Friesner
Subject: RE: RMA#502584: Reson 7111 transceiver

Dear Caryn, Bri and All,

Thanks for your email.

I just spoke with Caryn, and this is the plan:

1. We understand that the "loaner" 7111 Txcvr Box did not work upon receipt. At this point, we don't know what else can be done to troubleshoot it by telephone. (see #4 below)

2. The Fairweather 7111 Txcvr is due (per FedEx website) at RESON by 10:30am tomorrow. We will test it immediately upon receipt.

3. The Fairweather 7125-SV Processor (RMA#502555) has been tested but no fault found to date. We will continue to test it non-stop for the next 1-2 days. If still no fault found, we will ship it back to either Ketchikan or Seattle for scheduled in-port.

4. Tentatively, we plan to send a Sr. Level Engineer to the Fairweather with the 7111 Tx Box and 7125-SV Processor. We will try to get him and the equipment up there by Sunday, May 23rd as "Plan A". I will meet with our shipping manager tomorrow to discuss the logistics of getting the two boxes of equipment up to Ketchikan on short notice, assuming we have to ship it on Thursday or Friday.

5. "Plan B" is that our Engineer will meet the Fairweather in Seattle on May 27th.

6. Regardless, we will start to put together spare parts and tools for this trip. We will be prepared to test and repair either the 7111 Processor Box or the 7111 Txcvr Box.

Yes, both of these cases will be treated as Warranty RMA's.

Please let me know if you have any further questions. I can be reached by email or cell phone (805)701-6697 as main POC for this field visit.

Regards,
Brett Evans
RESON Support

-----Original Message-----
From: Caryn Arnold [mailto:Caryn.Arnold@noaa.gov]
Sent: Wednesday, May 19, 2010 11:49 AM
To: ops.fairweather
Cc: Brett Evans; Jim Lynn; Justin Friesner; Olivia Hauser; chiefet fairweather; Matthew Jaskoski; Larry Loewen; Edward.J.Vandenameele@noaa.gov; _NMAO MOP XO Fairweather; 'Todd Irby'; co fairweather
Subject: Re: Reson 7111 transceiver

Hello All,

This is a critical piece of equipment for the upcoming projects. Since we still have Reson Support days I think this is a time to utilize some of them. If Reson can get the Fairweather transceiver working, will they

be able to send a Rep, along with the 7111 transceiver, to Ketchikan, AK

before the ship heads south on Sunday, May 23rd? At this time the Reson Rep could also return Launch 2806's 7125SV Processor. Reson hasn't been able to reproduce the power issue, however, the loaner from Reson that was installed is not having any problems. If a Reson Rep is going to the

ship then they could observe the 7125 in the field.

v/r,
Caryn

ops.fairweather wrote:

> Hi Brett,
>
> Does Eric have any more things for us to try to get the loaner 7111 transceiver working? The 7111 is the primary system we plan to use for
>
> June- Sept and we haven't even patch tested it yet. It's critical that
>
> we get that system back up before we in-port in Seattle May 27 so that
>
> we can patch test it before the start of the upcoming ship projects, especially since we'll be operating in very remote areas over the next
>
> four months.
>
> Many thanks,
>
> Bri
>
> PS/FYI
>
> Our schedule for the next few weeks/months:
>
> ~May 23/24: Start transit from Behm Canal (Ketchika, AK) to Seattle, doing a 1000-ftm contour survey for the Canadian Government on the way
>
> south with the Reson 8160
>
> May 27 -June 1: In port in Seattle
>
> June 1 - July 2: Olympic Coast National Marine Sanctuary Survey
>
> July 7 - Sept 8: Bering Strait Survey

On 5/18/2010 9:09 PM, Brett Evans wrote:

> Hi Bri,
>
> One of our engineers, Eric Schug, will call you shortly about the 7111.
>
> Regards,
>
> Brett Evans
>
> RESON Support
>
> *From:* Justin Friesner
> *Sent:* Tuesday, May 18, 2010 1:52 PM
> *To:* Brett Evans
> *Subject:* Bri on fairweather
>
> Brett,
>
> Bri's number is 907-254-0032
>
> justin
>
> Justin P. Friesner
>
> Senior Field Engineer
>
> Reson Inc.
>
> 100 Lopez Road
>
> Goleta
>
> CA 93117
>
> USA
>
> Tel: +1 805 964 6260
>
> Fax: +1 805 964 7537
>
> Cell: +1 805 708 5059

--
LT Briana Welton
Field Operations Officer
NOAA Ship Fairweather
1010 Stedman St
Ketchikan, AK 99901
907-254-2842 (ship's cell)
808-659-0054 (ship's sat)

Fairweather communications can be unreliable. If you suspect email is not going to or from the ops.fairweather
email account, try emailing briana.welton@noaa.gov or calling

907-254-0032.

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : March 26, 2010

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O351-FA-2009
HYDROGRAPHIC SHEET: H12144

LOCALITY: Northern Extent of Muir Inlet to Wachussett Inlet, AK
TIME PERIOD: October 22 - November 3, 2009

TIDE STATION USED: 945-2548 Muir Inlet, AK
Lat. 58° 57.8'N Long. 136° 06.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.788 meters

TIDE STATION USED: 945-2632 Wachussett Inlet, AK
Lat. 58° 56.8' N Long. 136° 20.1' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.849 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA314 and SEA319

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).

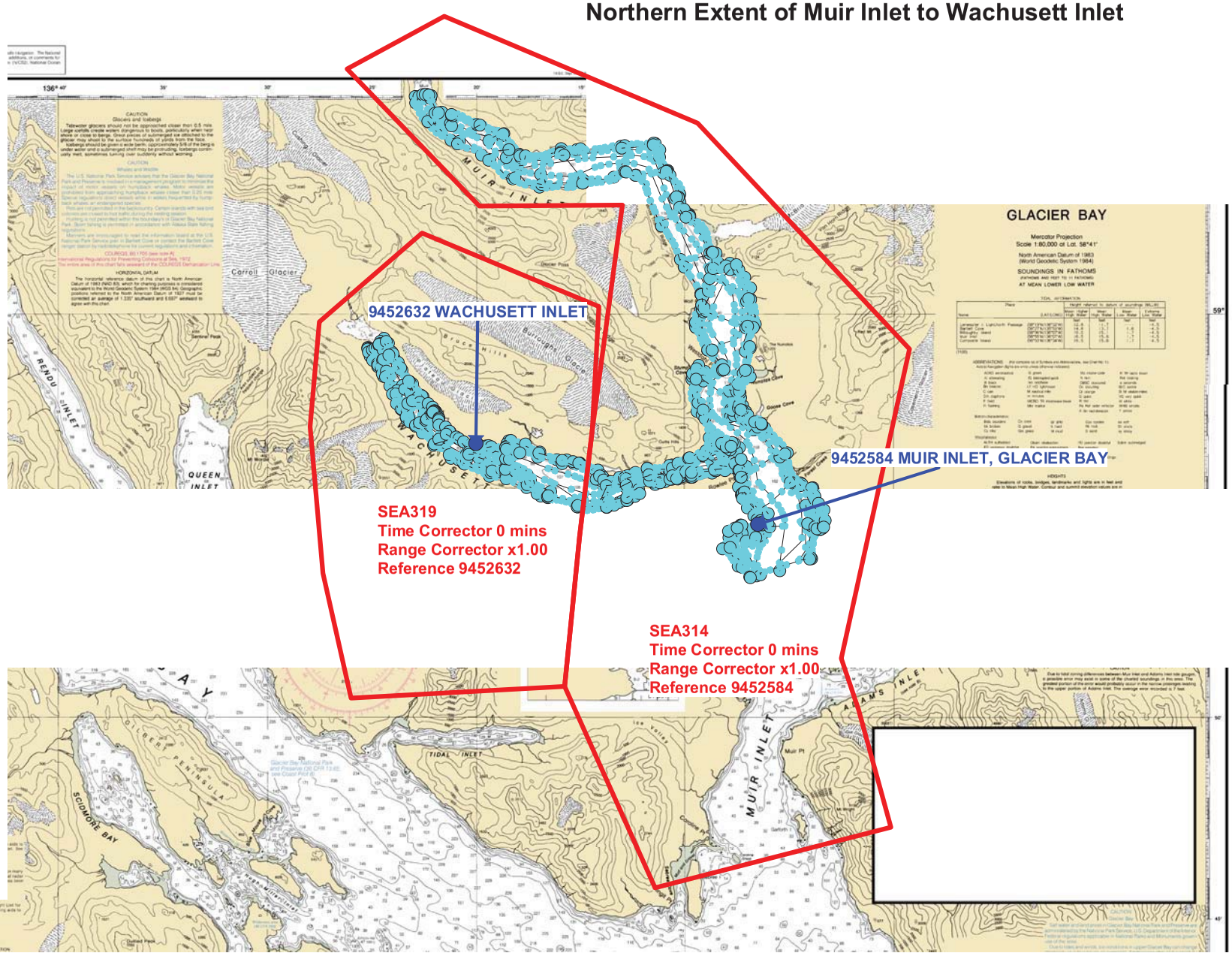
Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector file (*.ZDF). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

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: 2010.04.06 07:11:45 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION

Final Tidal Zoning for OPR-O351-FA-2009, H12144
Northern Extent of Muir Inlet to Wachusett Inlet



H12144 HCell Report

Katie Reser, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H12144 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 H12144 were compiled to the largest scale raster chart(s) shown below:

Chart	Scale	Edition	Edition Date	NTM Date
17318	1:80,000	7th	03/01/2009	07/02/2011

The following ENC(s) were also used during compilation:

Chart	Scale
US4AK3DM	1:80,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from a 16-meter multibeam combined surface in CARIS BASE Editor. A shoal-biased selection was made at 1:15,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
-5	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 layer (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	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 H12144_SS.000
0	0.000	0.2286	0.125	0
3	5.4864	5.715	3.125	3
5	9.144	9.3726	5.125	5
10	18.288	18.5166	10.125	10
20	36.576	37.9476	20.750	20
30	54.864	56.2356	30.750	30
50	91.44	92.8116	50.750	50
100	182.88	184.2516	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 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 H12144:

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
*DEPCNT	Zero contours
M_QUAL	Data quality meta object
OBSTRN	Foul areas
SBDARE	Bottom types and ledge
SOUNDG	Soundings at the chart scale density
*UWTROC	Rocks

* The M_QUAL is adequate for NDB product searches except for features in these object classes which reside outside the M_QUAL limits.

The *_SS HCell contains the following Objects:

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

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

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

Chart Unit Base Cell Units:

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

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

BASE Editor and S-57 Composer Units:

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

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

9. Data Processing Notes

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

10. QA/QC and ENC Validation Checks

H12144 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

H12144_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:80,000
H12144 _SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:15,000
H12144 _DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H12144 _Outline.gml	Survey outline
H12144 _Outline.xsd	Survey outline

11.2 Software

CARIS HIPS Ver. 7.0	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.2	Creation of soundings and bathy-derived features, meta area objects, and blue notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.2	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Northport Systems, Inc., Fugawi Marine ENC Ver.3.1.0.435	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

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APPROVAL SHEET
H12144

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

Katie J. Reser

Katie Reser
2011.08.12
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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.

Pete Holmberg

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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.

Gary C. Nelson

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