H12934

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12934

LOCALITY

State(s):	North Carolina
General Locality:	Approaches to Wilmington
Sub-locality:	11 Miles South East of Frying Pan Shoals

2016

CHIEF OF PARTY
LCDR Matthew Jaskoski

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12934**

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

State(s):	**North Carolina**
General Locality:	**Approaches to Wilmington**
Sub-Locality:	**11 Miles South East of Frying Pan Shoals**
Scale:	**40000**
Dates of Survey:	**09/20/2016 to 10/21/2016**
Instructions Dated:	**06/29/2016**
Project Number:	**OPR-G309-FH-16**
Field Unit:	**NOAA Ship *Ferdinand R. Hassler***
Chief of Party:	**LCDR Matthew Jaskoski**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks: *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. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via https://www.ncei.noaa.gov/.*

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12934

Project: OPR-G309-FH-16

Locality: Approaches to Wilmington

Sublocality: 11 Miles South East of Frying Pan Shoals

Scale: 1:40000

September 2016 - October 2016

NOAA Ship *Ferdinand R. Hassler*

Chief of Party: LCDR Matthew Jaskoski

A. Area Surveyed

Survey H12934 was conducted southeast of Cape Fear, with a sublocality of 11 miles southeast of Frying Pan Shoals.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
33° 22' 43.76" N 7° 33' 20.98" W	33° 17' 41.65" N 77° 19' 6.53" W

Table 1: Survey Limits

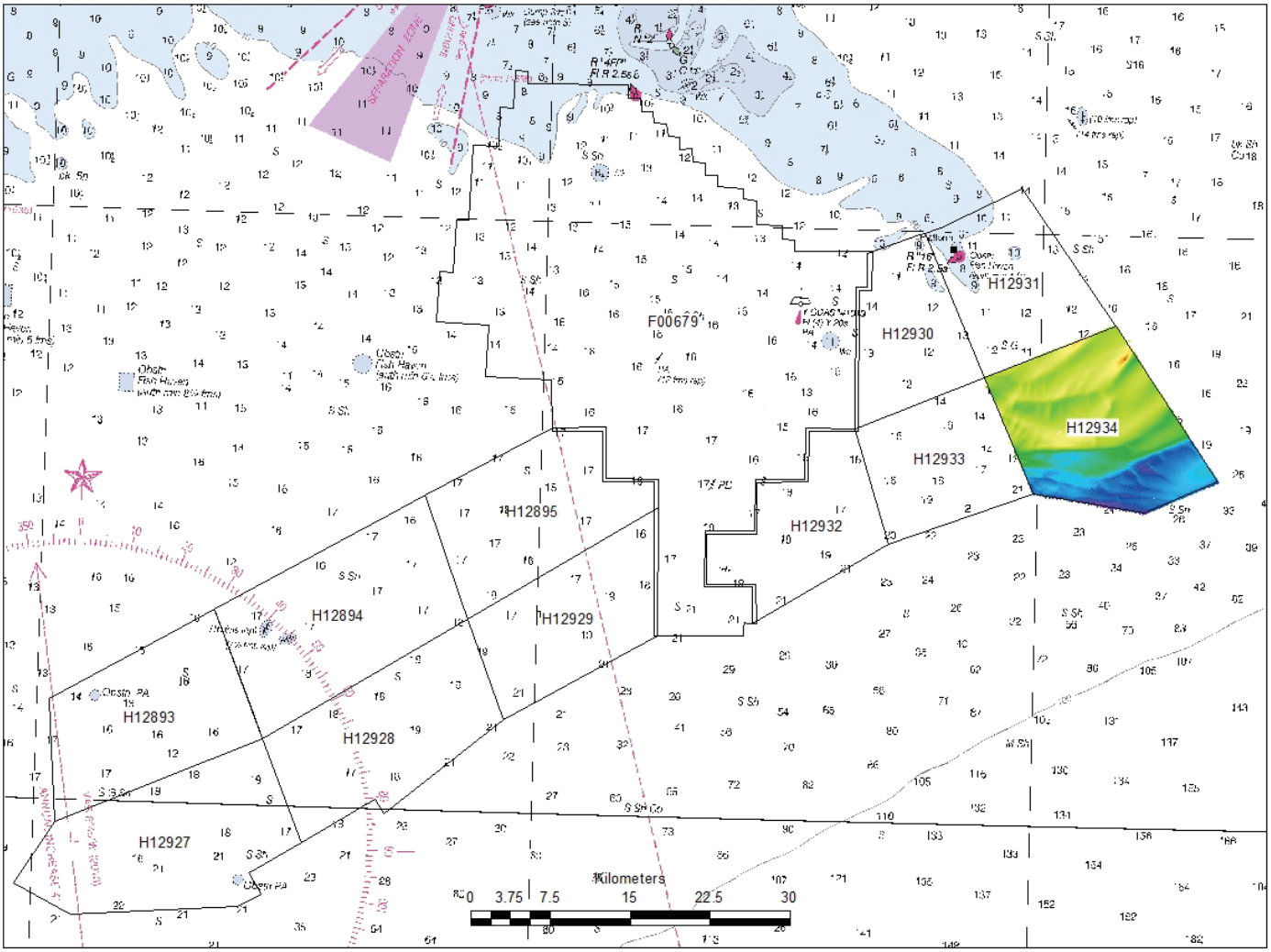


Figure 1: H12934 Survey Limits Overlaying RNC 11520

Survey limits were acquired in accordance with the requirements in the Project Instructions and the 2016 HSSD.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. The project is based on a request from an Atlantic Coast Port Access Route Study conducted by Pacific Northwest National Laboratory at the request of the U.S. Coast Guard to delineate traffic corridors using Automatic Identification System (AIS). This project will improve the chart for traffic navigating from Port to Port along the Atlantic Ocean Channel.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
All waters in survey area.	Complete Multibeam with Backscatter. Refer to the 2016 HSSD Section 5.2.2.3.

Survey coverage was in accordance with the requirements listed above and in the 2016 HSSD.

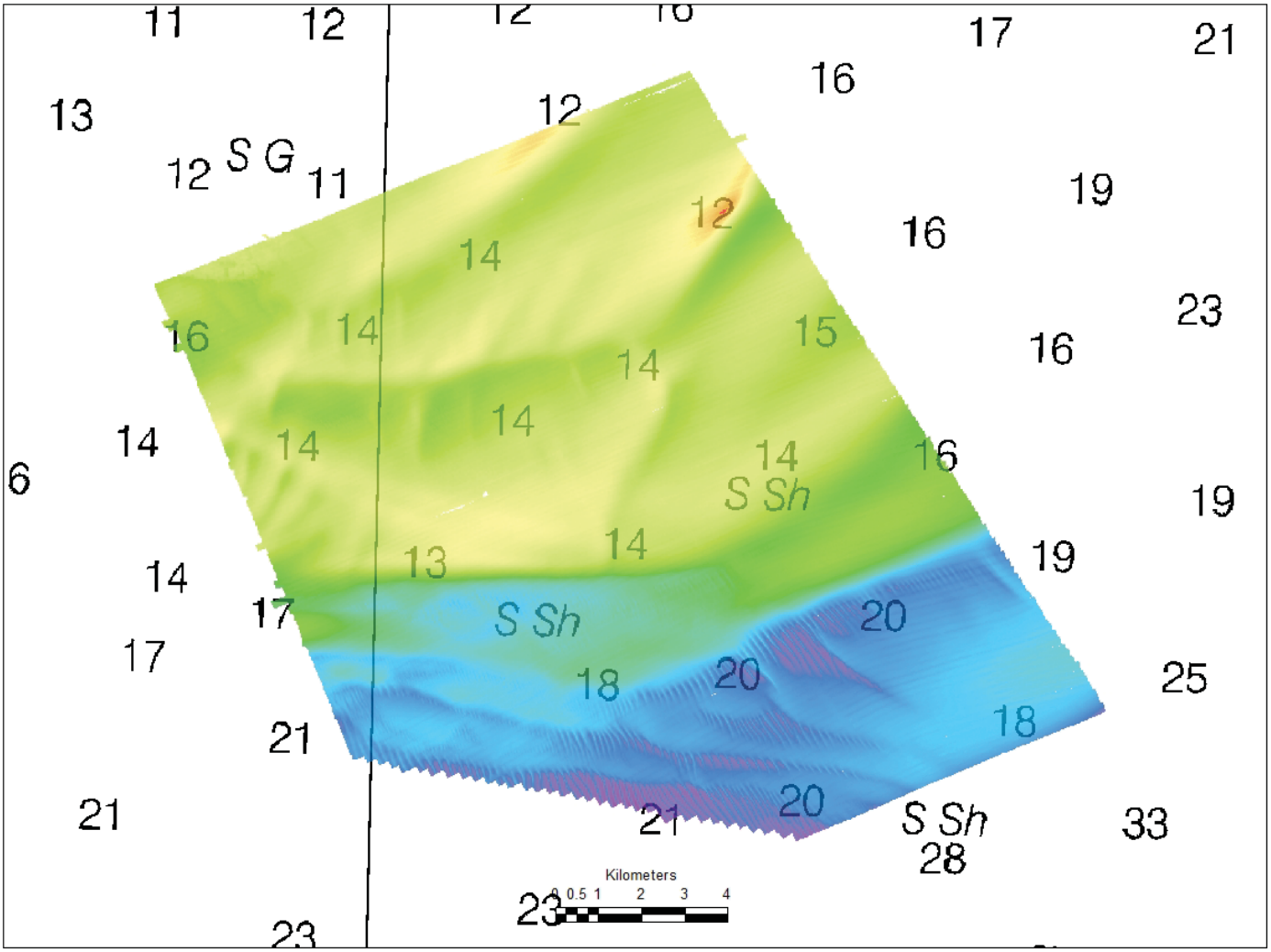


Figure 2: Survey layout for H12934 overlaying RNC 11520.

A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

	HULL ID	*S250*	*Total*
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	919.43	919.43
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	57.93	57.93
	Lidar Crosslines	0	0
Number of Bottom Samples			5
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			83.2

Table 2: Hydrographic Survey Statistics

The following table lists the specific dates of data acquisition for this survey:

Survey Dates	Day of the Year
09/20/2016	264
09/21/2016	265

Survey Dates	Day of the Year
09/22/2016	266
09/23/2016	267
09/24/2016	268
09/25/2016	269
09/26/2016	270
10/21/2016	295

Table 3: Dates of Hydrography

Mainscheme survey lines were run with a dual-head multibeam echosounder. Linear nautical miles were calculated using statistics from the starboard sonar head.

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

Hull ID	*S250*
LOA	37.7 meters
Draft	3.77 meters

Table 4: Vessels Used

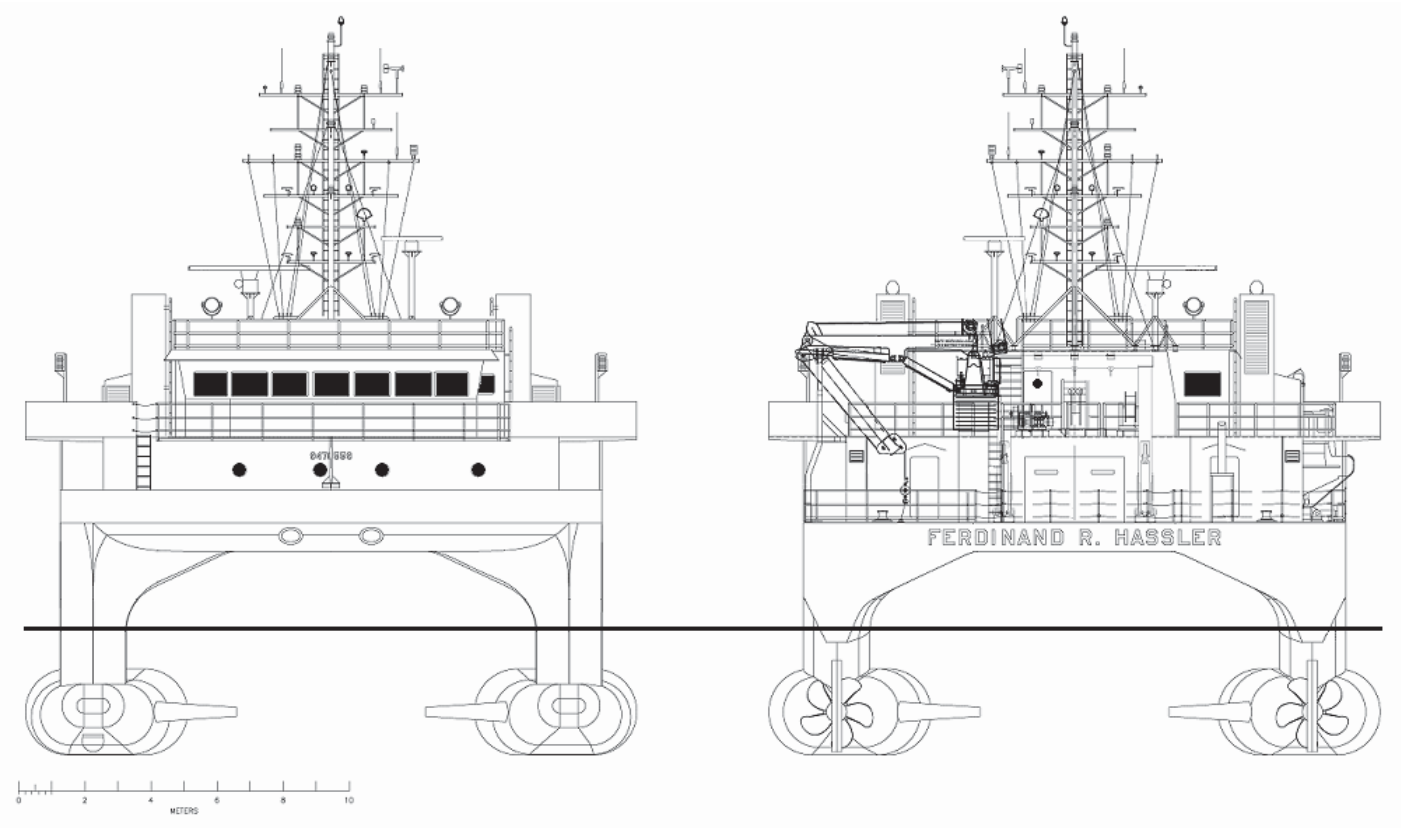


Figure 3: NOAA Ship Ferdinand R. Hassler

NOAA Ship FERDINAND R. HASSLER (S250), shown in Figure 3, acquired all surveyed soundings during operation for H12934.

B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

Manufacturer	Model	Type
RESON	SeaBat 7125	MBES
Applanix	POS M/V 320 V5	Positioning and Attitude System
Hemisphere	MBX-4	Positioning System
AML Oceanographic	MircoCTD	Sound Speed System
ODIM Brooke Ocean	MVP-200	Sound Speed System
Reson	SVP-70	Surface Sound Speed System
Sea-Bird Electronics	SBE 19plus SeaCAT	Conductivity, Temperature and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 6.30% of mainscheme acquisition.

The ratio of crossline to mainscheme mileage was calculated to be 6.30% which is within specifications set forth in section 5.2.4.3 of the 2016 HSSD.

A geographic plot of crosslines is shown in Figure 4. To evaluate crossline agreement, two 2-meter surfaces were created: one from the crossline depths, the other from the mainscheme depths. Data from crosslines were filtered to 45 degrees for the 2-meter crossline surface. These two surfaces were differenced using CARIS BASE Editor. The two surfaces are in excellent agreement. Nodes totaling greater than 2.4 million have a difference value range between -2.44 and 1.27 meters. The statistical analysis of the differences between the mainscheme and crossline surfaces is shown in Figure 5. The average difference between the surfaces is 0.04 meters with a standard deviation of 0.12 meters; Ninety-five percent of nodes agree within +/- 0.24 meters of the mean.

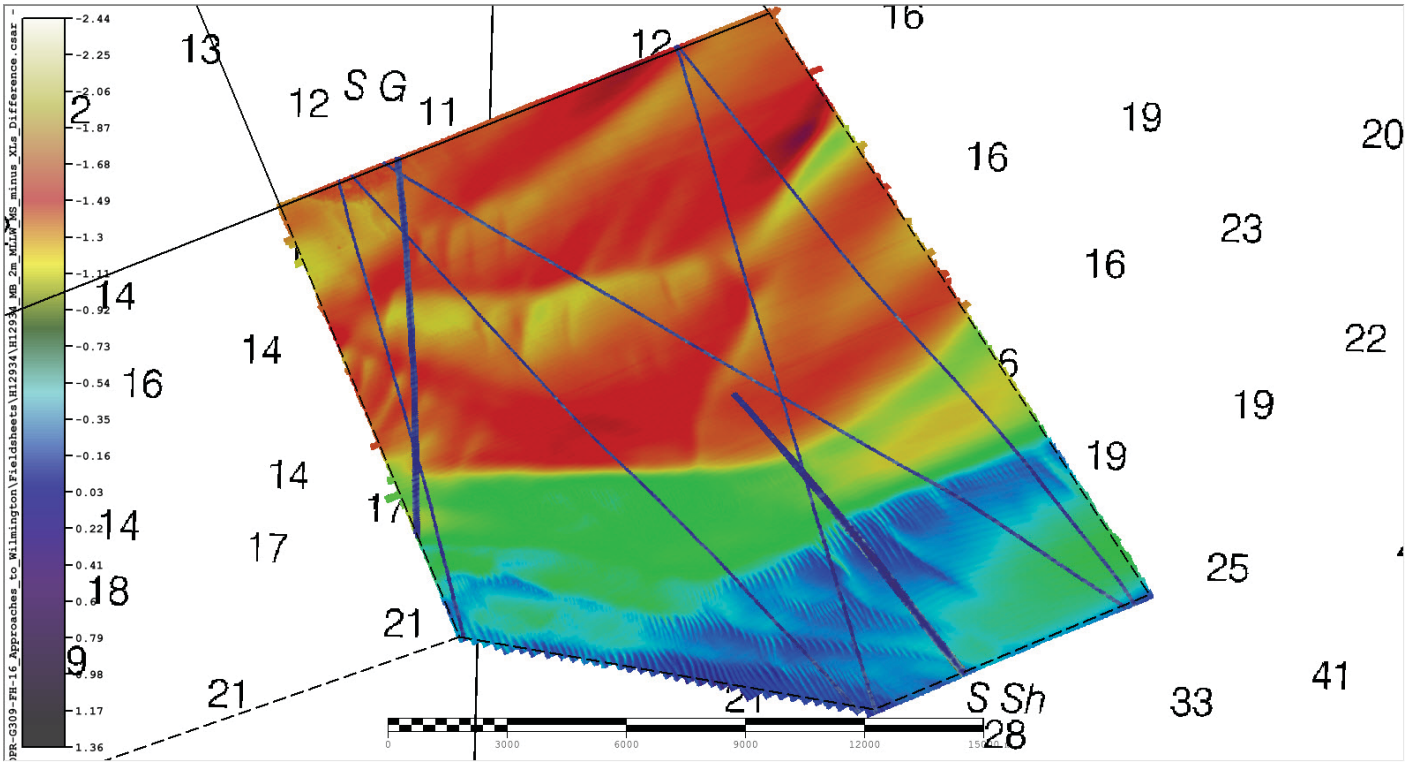


Figure 4: H12934 MBES crossline data overlaid on mainscheme data. The legend represents the difference surface values.

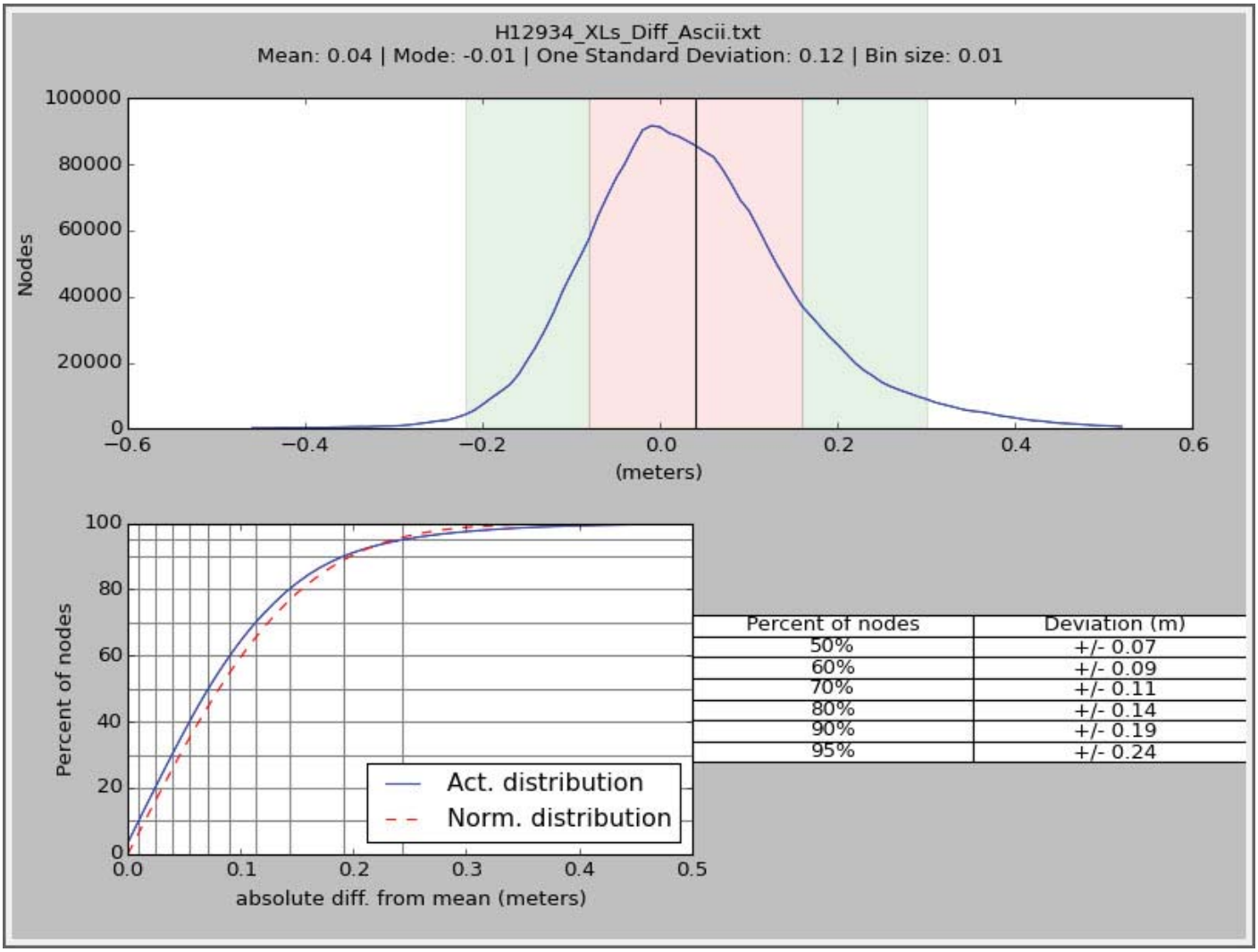


Figure 5: H12934 crossline difference statistics. Mainscheme minus crosslines.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0.01 meters	0.148 meters	ERS via VDATUM

Table 6: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S250	1 meters/second	1 meters/second	0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values.

Two (2) tidal models were available for water level corrections associated with survey H12934. A discrete tide zone file, produced by CO-OPS for project OPR-G309-FH-16, was provided to the field unit. Additionally, a vertical datum transformation (VDatum) model was delivered to the field unit in the project instructions. All data for survey H12934 were reduced to MLLW via VDatum. This model functioned as a gridded separation model for GPS tide computations with a 0.148 meter uncertainty. Final TPU calculations are derived from the following sources: VDatum separation model, sound velocity (CTD and surface velocimeter), HVF uncertainties, and SBET post processed uncertainty.

B.2.3 Junctions

Two contemporary surveys of the same project junction with H12934. H12930 adjoins H12934 to the west, while H12931 adjoins to the north.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12930	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	W
H12931	1:40000	2016	NOAA Ship FERDINAND R. HASSLER	N

Table 8: Junctioning Surveys

H12930

Survey H12934 junctions with its contemporary survey H12930 to the west and their respective nodes overlap by approximately 200 to 600 meters. The minimum and maximum depth difference between the two surveys is -0.61 and 1.10 meters respectively. Of the greater than 600,000 overlapping nodes, the average difference is 0.02 meters with a standard deviation of 0.12 meters; Ninety-five percent of the differenced nodes are within +/-0.22 meters of the mean, as shown in Figure 7.

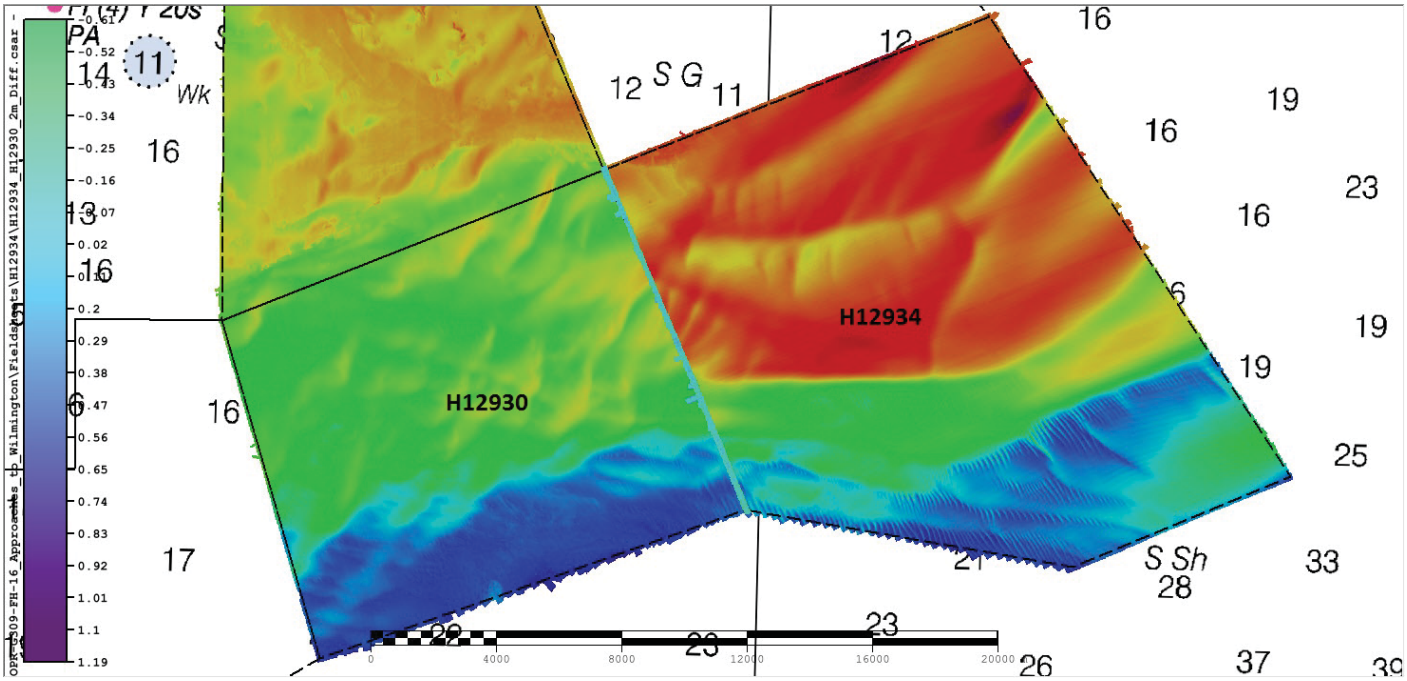


Figure 6: H12934 and H12930 junction

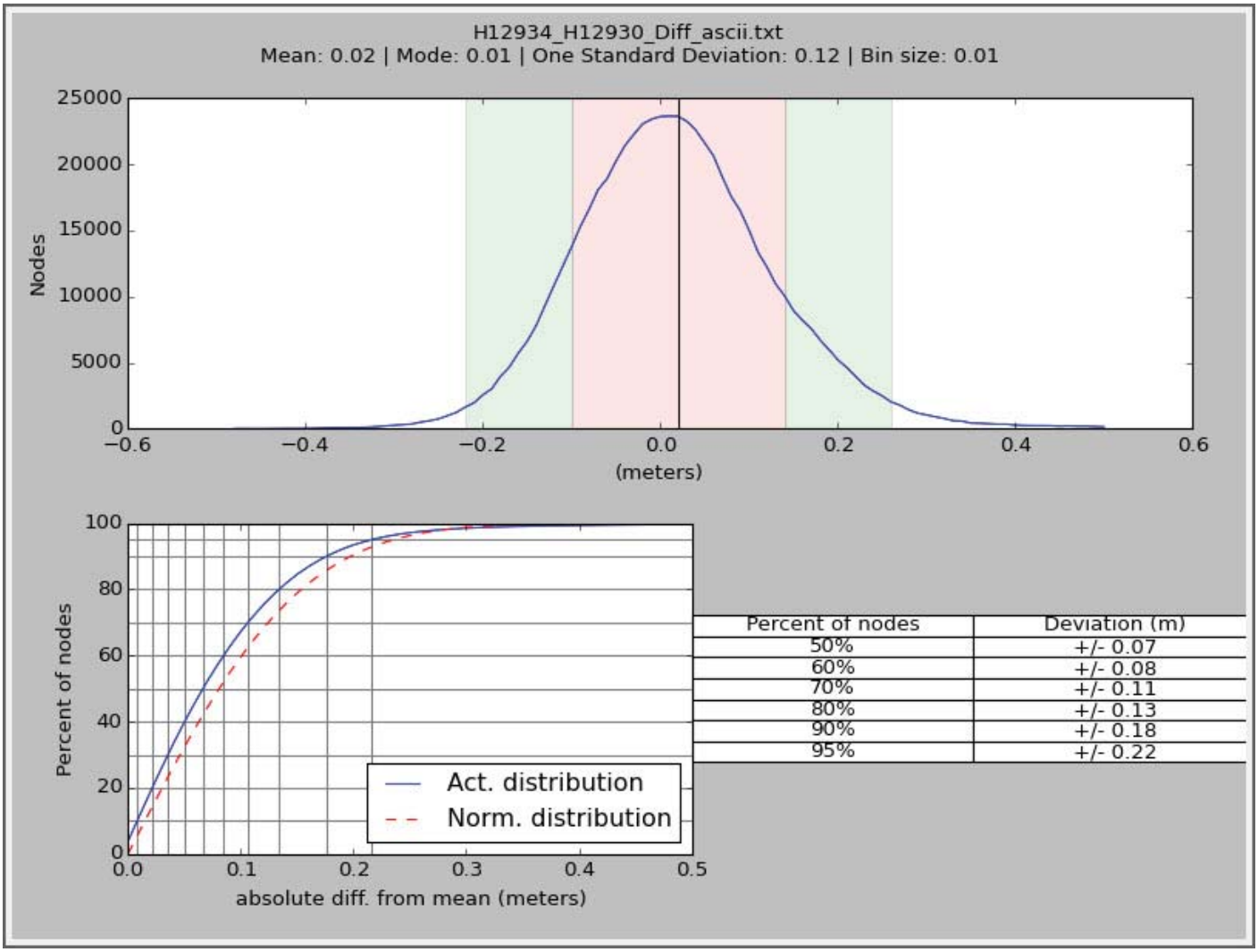


Figure 7: Difference surface statistics for H12934 and 12930

H12931

Survey H12934 junctions with its contemporary survey H12931 to the north and their respective nodes overlap by approximately 150 to 500 meters. The minimum and maximum depth difference between the two surveys is -0.77 meters and 0.41 meters respectively. Of the greater than 900,000 overlapping nodes, the average difference is -0.01 meters with a standard deviation of 0.10 meters; Ninety-five percent of the differenced surface nodes are within +/- 0.20 meters of the mean, as shown in Figure 9.

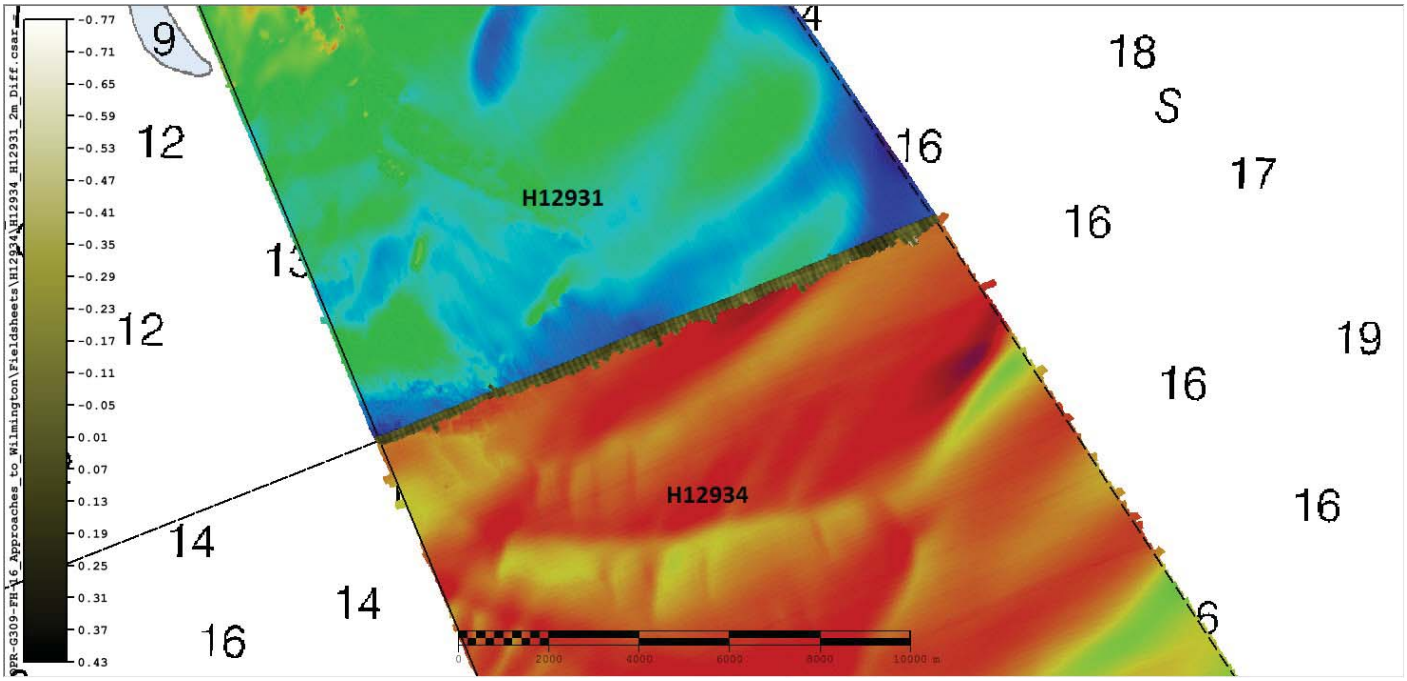


Figure 8: H12934 and H12931 junction

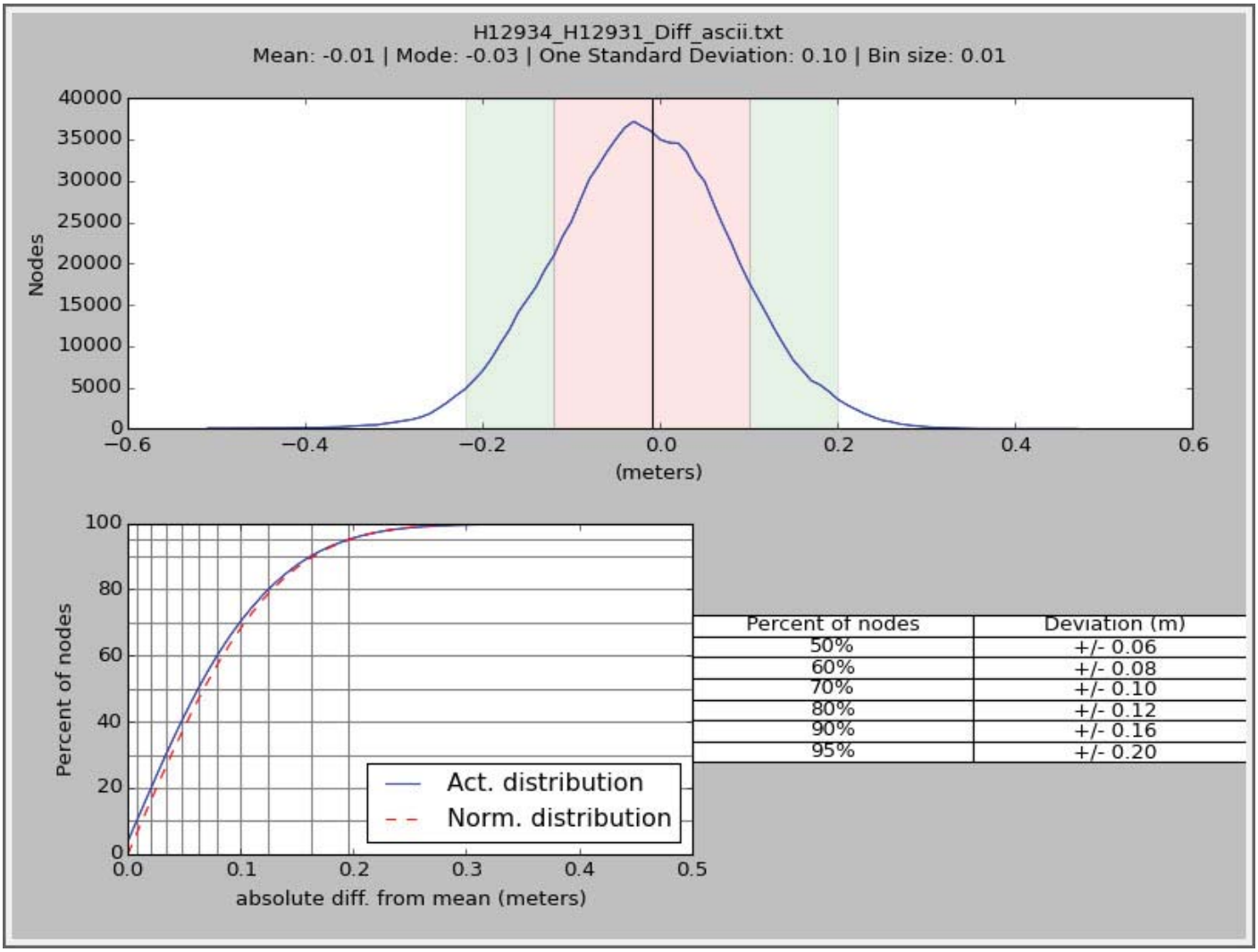


Figure 9: Difference surface statistics for H12934 and H12931

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

There were no conditions or deficiencies that affected equipment operational effectiveness.

B.2.6 Factors Affecting Soundings

SBET Anomaly

A vertical offset of up to 0.5 meters can be seen in the data collected on DN267 and DN269, lines 2016_2670314 port and 2016_2691211 port. This abnormality is due to an SBET with periods of poor quality vertical solutions. The vertical offset is not seen when the data are reduced to chart datum via discrete zoning. The oscillations in the vertical solution are within the TVU specifications for the depth of the area. (See Figure 14):

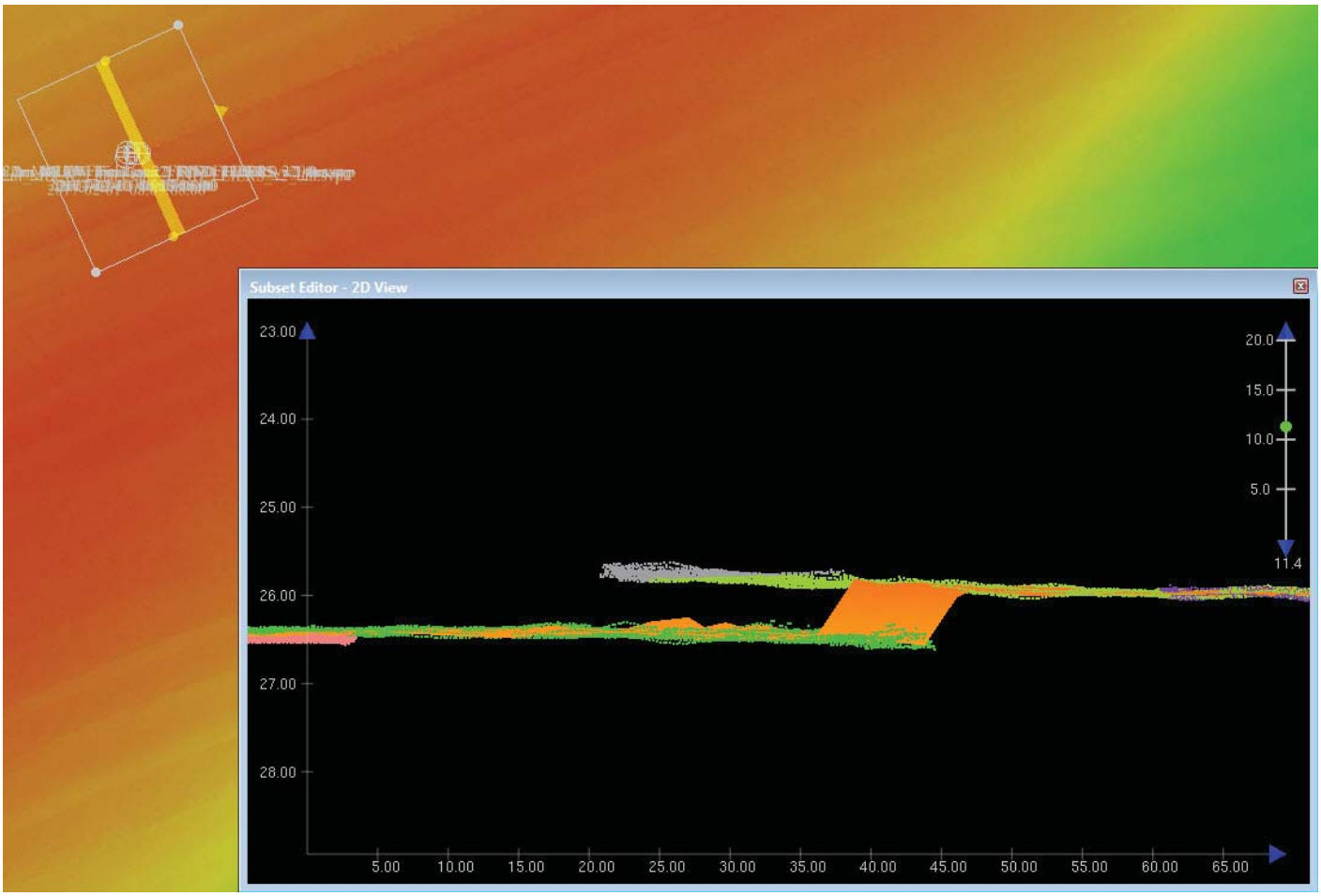


Figure 10: Example of SBET anomaly.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Static casts were collected (Via-Seabird-CTD) approximately every two to four hours.

During the course of acquisition a total of 40 sound speed measurements were collected via Seabird-CTD. Sound speed corrections were applied in CARIS HIPS/SIPS using the Nearest in Distance Within Time

(NIDWT) selection with time frequency of 4 hours. Seven Casts were taken greater than 200 meters outside of the survey area due to operational and efficiency constraints of the ship.

Overall, cast frequency was appropriate as evidenced via a ray tracing uncertainty analysis identifying casts that exceeded the allowance for refraction as defined in 2016 HSSD Section 5.2.3.5. As shown in Figure 13, that shows the ray tracing uncertainty analysis for all sound speed profiles during H12934. The blue lines represent consecutive cast comparisons, and the red dots represent the allowable vertical uncertainty due to refraction. None on the blue lines rise above the red dots, and therefore do not exceed the allowable uncertainty. As shown, refraction issues never exceed allowable error tolerances.

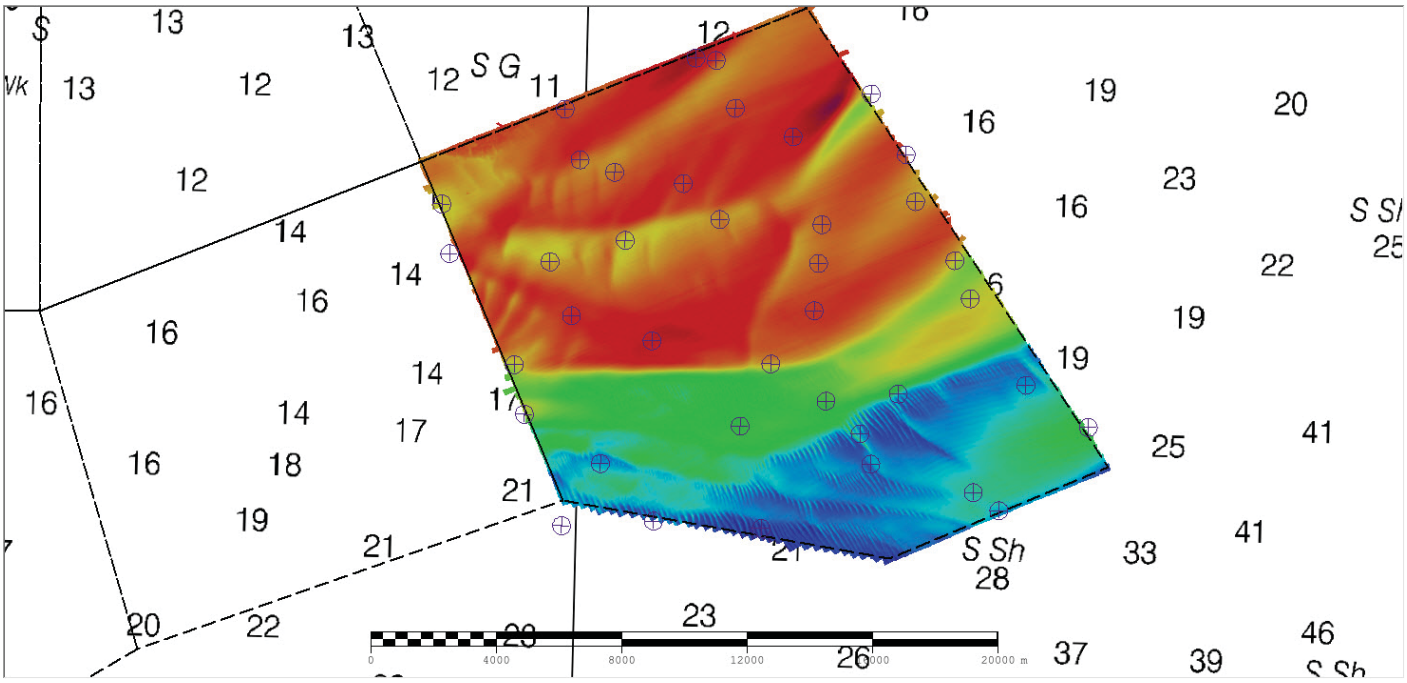


Figure 11: H12934 sound speed profile locations.

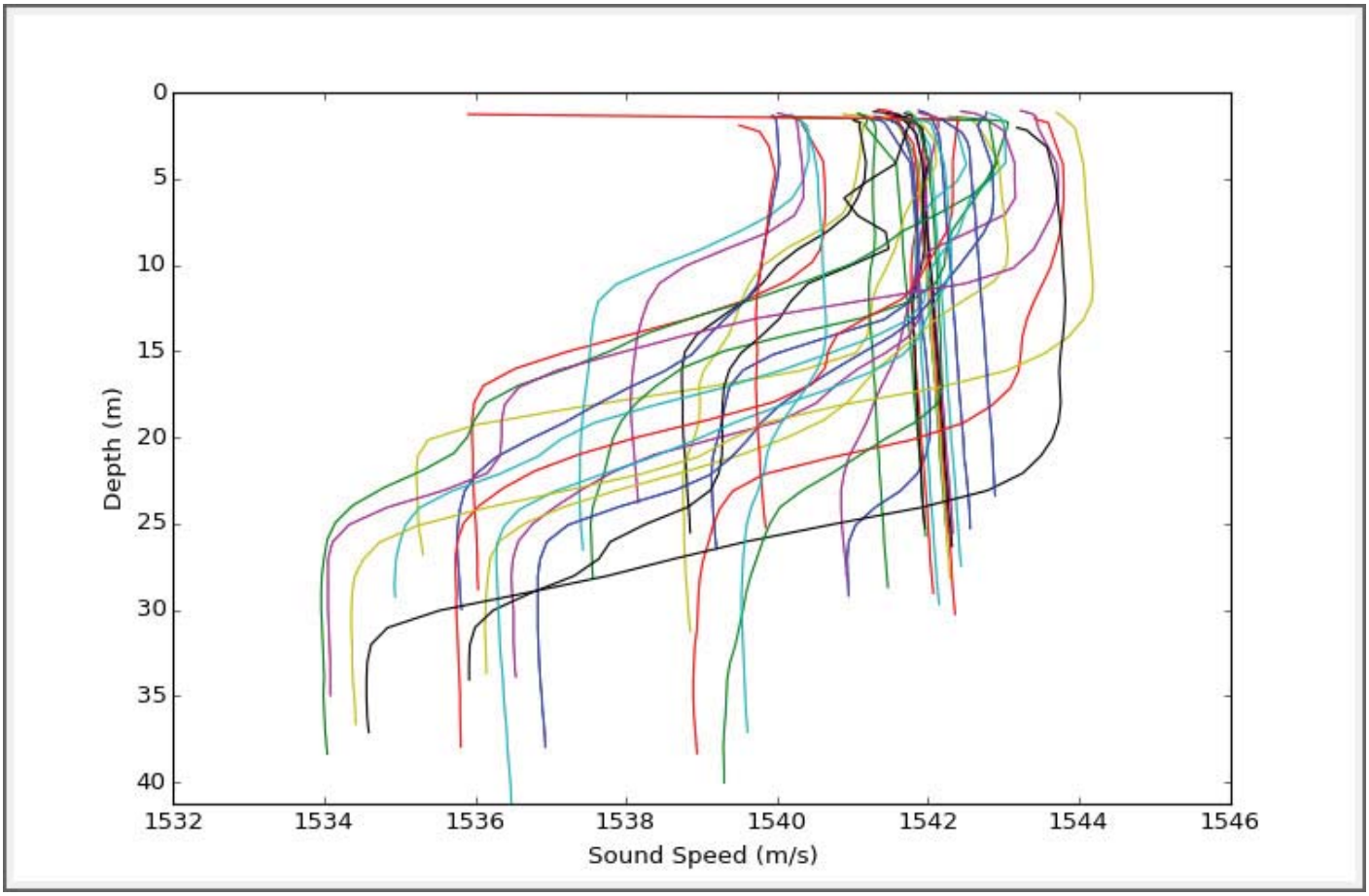


Figure 12: Sound speed profiles for Survey H12934.

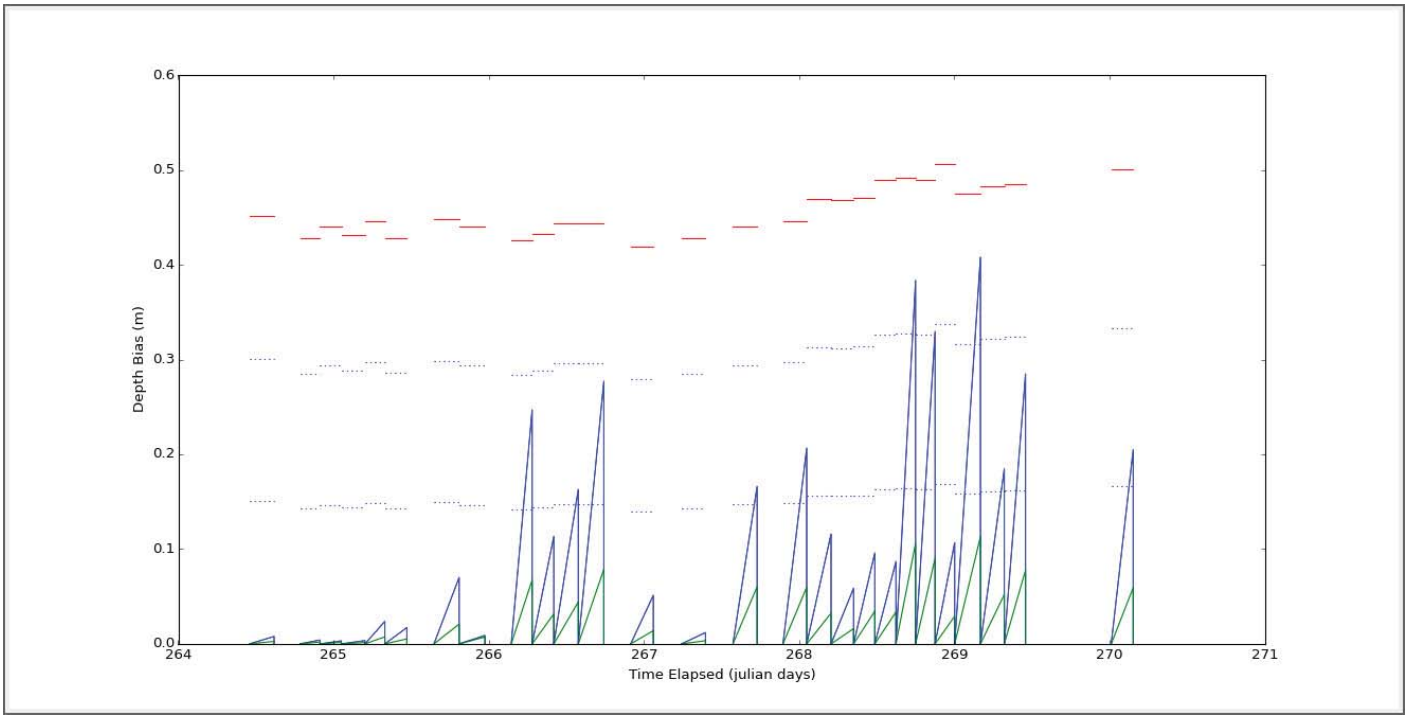


Figure 13: Ray tracing uncertainty analysis for all H12934 sound speed profiles.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was logged in RESON datagram 7008 snippets record in the raw .s7k files. The .s7k file also holds the navigation record and bottom detections for all lines of survey H12934. The files were paired with the CARIS HDCS data, imported, and processed using Fledermaus Geocoder Toolbox (FMGT). The FMGT projects and backscatter mosaic imagery are included in the field submission. The processed mosaic

is formated as a geo-referenced tiff image per specifications. The following information is provided as metadata for the processing branch:

Backscatter data processing and mosaicing performed in Fledermaus FMGT version 7.6.2. Backscatter data has a histogram range of 10 to -70dB Backscatter data is provided in separate layers broken down by survey vessel hull number and sonar operating frequency.
H12934_S250_Port_400kHz | 4m resolution mosaic
H12934_S250_Stbd_400kHz | 4m resolution mosaic

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
Caris	Caris HIPS and SIPS	9.0.24

Table 9: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Profile V_5_4

B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12934_MB_2m_MLLW	CUBE	2 meters	22.47 meters - 43.55 meters	NOAA_2m	Complete MBES
H12934_MB__2m_MLLW_final	CUBE	2 meters	22.47 meters - 40.00 meters	NOAA_2m	Complete MBES
H12934_MB_4m_MLLW	CUBE	4 meters	22.48 meters - 43.50 meters	NOAA_4m	Complete MBES
H12934_MB_4m_MLLW_final	CUBE	4 meters	36.00 meters -	NOAA_4m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
			43.50 meters		

Table 10: Submitted Surfaces

B.5.3 Data Density

A density analysis was run for the 2-meter and 4-meter finalized surfaces to calculate the number of soundings per surface node. The results determined that greater than 99.5% of all nodes contained five or more soundings which meets the data density specifications.

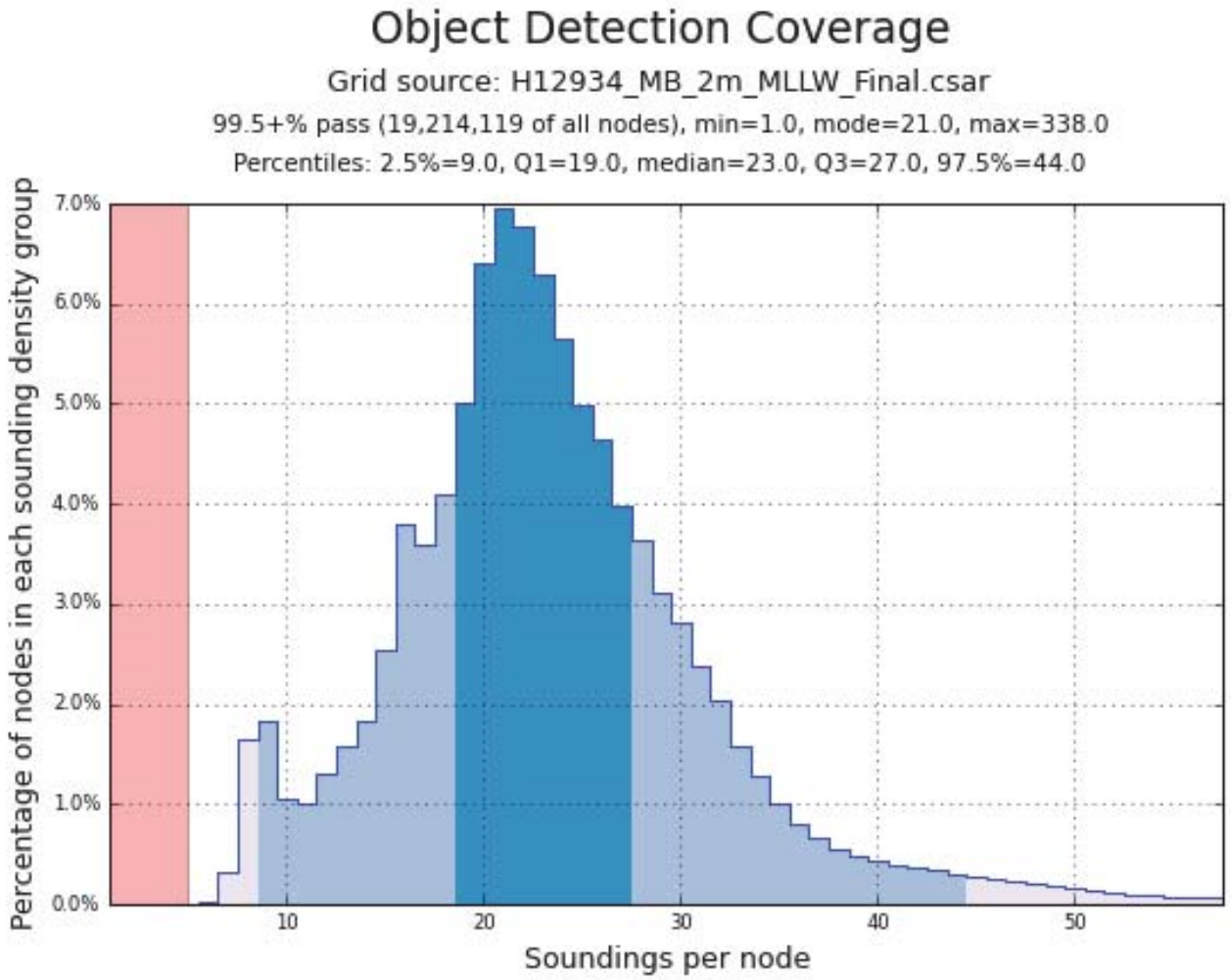


Figure 14: Data density of the 2-meter finalized surface

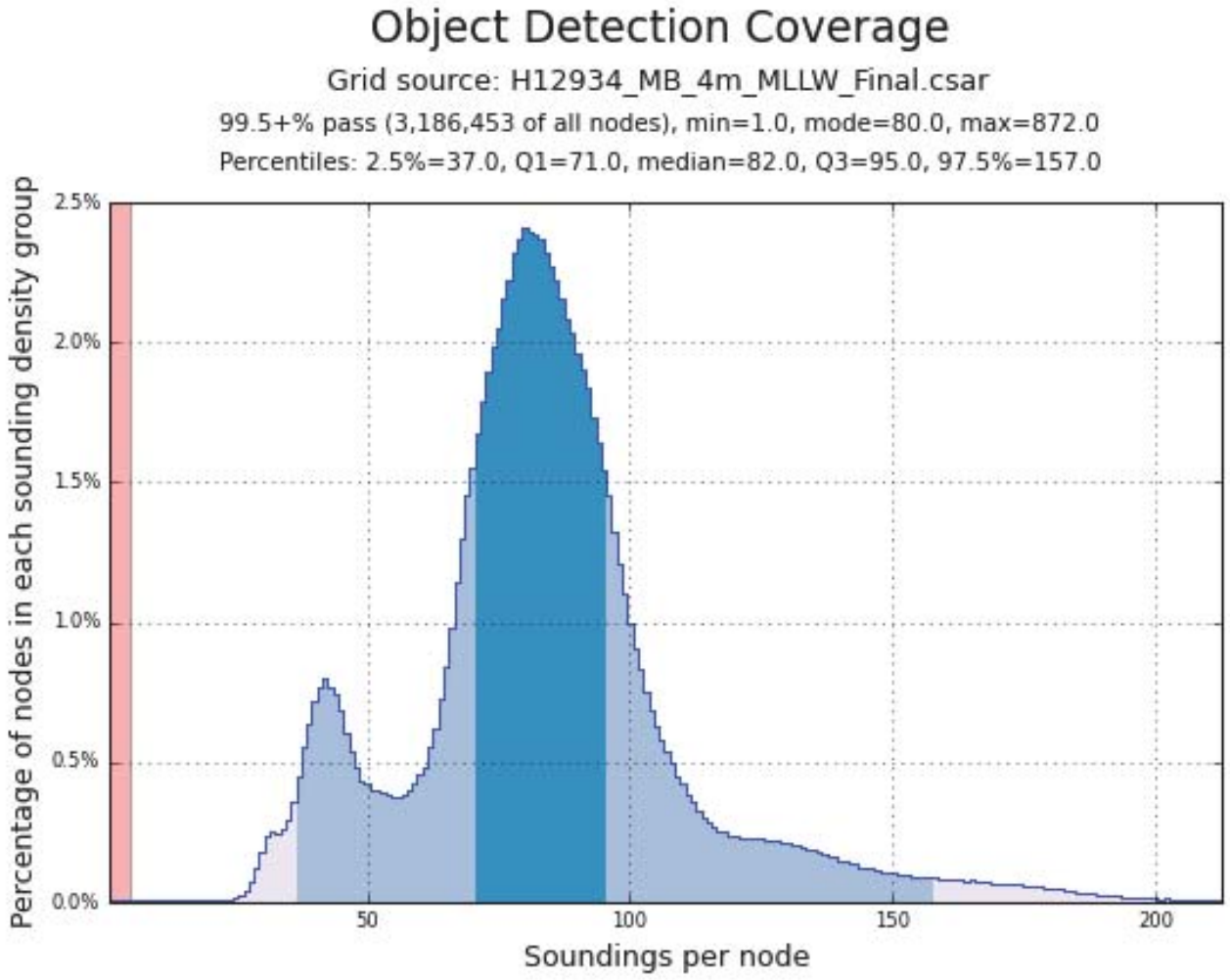


Figure 15: Data density of the 4-meter finalized surface

B.5.4 Total Vertical Uncertainty Analysis

Pydro's Finalized CSAR QA tool was used for the 2-meter and 4-meter surfaces to calculate the percentage of nodes which meet total vertical uncertainty (TVU) specifications. The resulting statistical analysis yielded greater than 99.5% of all nodes meet TVU specifications for both surfaces.

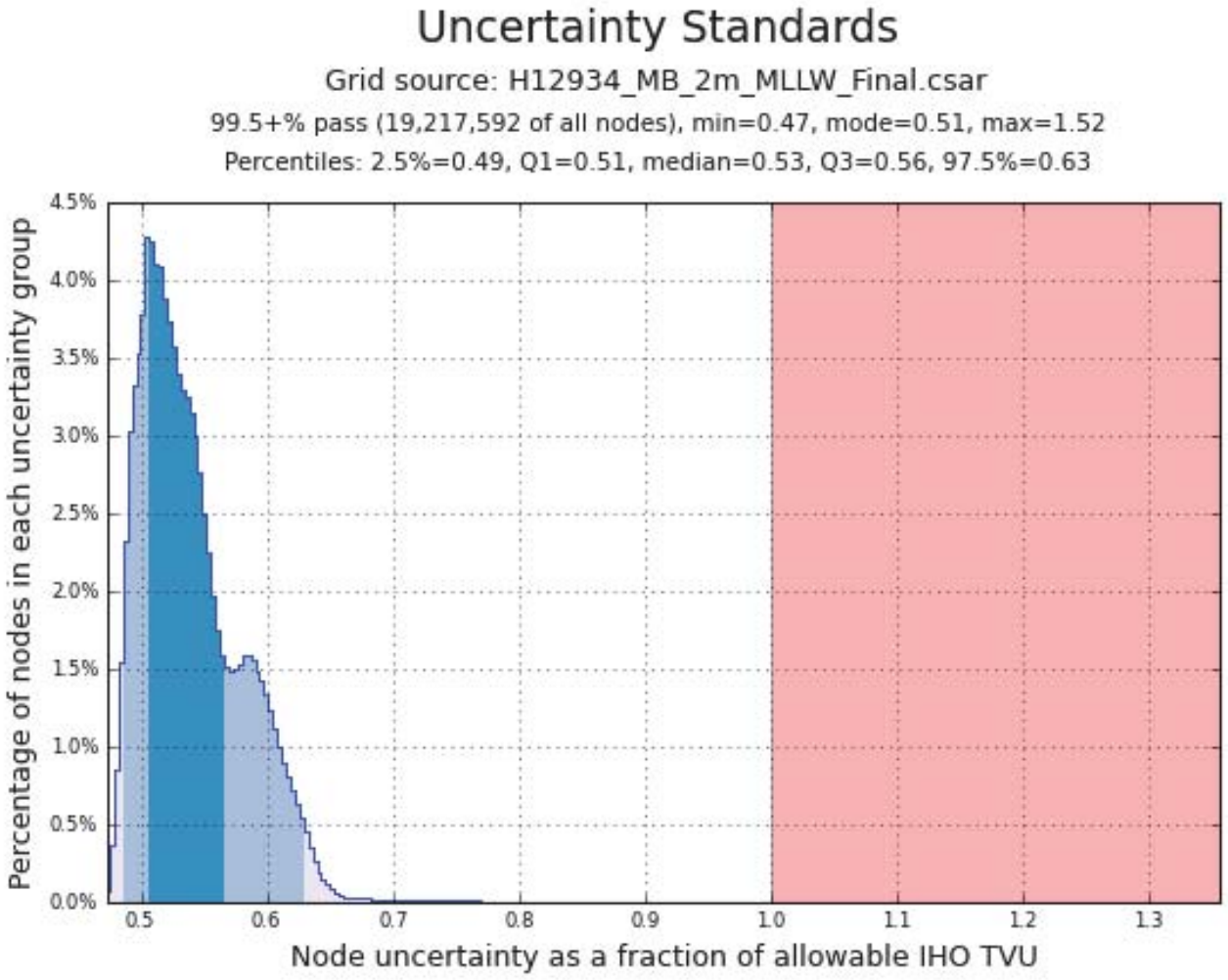


Figure 16: Total vertical uncertainty for 2 meter finalized surface

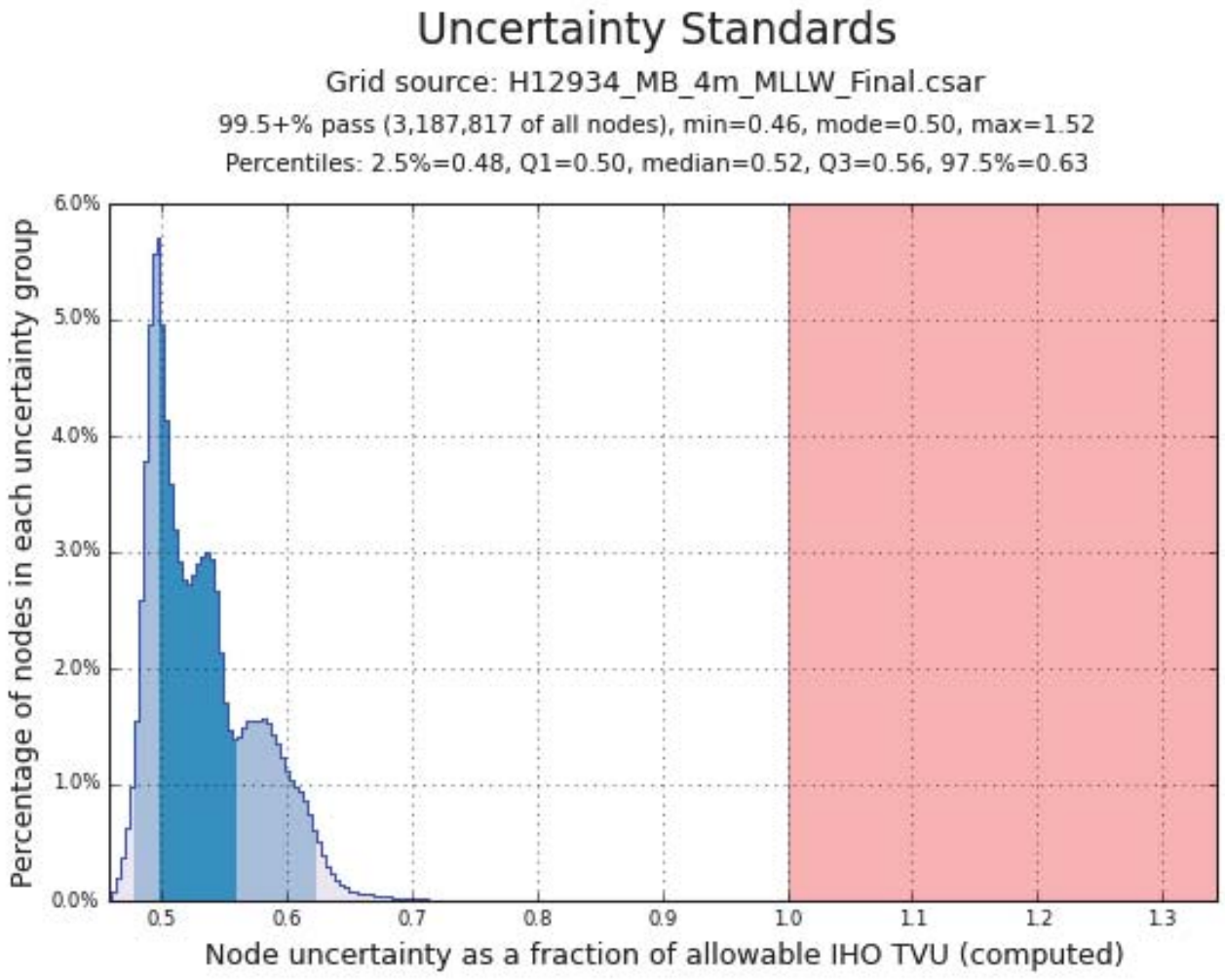


Figure 17: Total vertical uncertainty for 4-meter finalized surface

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying ERS Checkline and ERS Capability Memo(s).

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

ERS Methods Used:

ERS via VDATUM

Ellipsoid to Chart Datum Separation File:

G309FH16ExpandedProjectArea_xyWGS84-MLLW_geoid12b

All soundings submitted for H12934 have been reduced to MLLW using documented VDATUM techniques

C.2 Horizontal Control

The horizontal datum for this project is World Geodetic System of 1984: WGS84 (G1674).

The projection used for this project is UTM Zone 18 North.

An SBAS (satellite base augmentation solution) subscription was utilized through Fugro Marinestar to achieve a post-processed precise point position (5P) solution. See the associated DAPR for technical details.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Kensington, SC (292 kHz)

Table 11: USCG DGPS Stations

C.3 Additional Horizontal or Vertical Control Issues

3.3.1 Marinestar Subscription License

All data for survey H12934 has been reduced to Mean Lower Low Water (MLLW) using documented VDatum techniques. The Ferdinand R. Hassler is equipped with Applanix POS/MV position and orientation systems on the port and starboard hulls. Both POS/MV systems have been integrated with Fugro's Marinestar service, which provides real-time GPS correctors via satellite. The correctors are derived using a Precise Point Positioning (PPP) approach. The POS/MV data was post-processed in Applanix POSPac MMS to produce Smoothed Best Estimates of Trajectory (SBETs) and RMS uncertainty files using the method of Post Processed Precise Point Positioning (5P). The resulting SBETs and RMS files were applied in CARIS HIPS and SIPS to all data for survey H12934.

3.3.2 WGS84 Horizontal Datum

The horizontal datum requirement stated in the 2016 HSSD Section 2.1 was given as World Geodetic System of 1984 (WGS84(G1674)). The field unit followed this requirement, however, after the data acquisition had already begun, Hydrographic Technical Directive #2016-03 was published rescinding this requirement and re-established the horizontal datum requirement to be the North American Datum 1983 (NAD83). Subsequent email correspondence from the Chief of HSD Operations stated that any survey initiated in the WGS84 horizontal datum may be continued for the duration of the project and or sheet.

3.3.3 Traditional Tides

All soundings submitted with H12934 are reduced to MLLW using documented VDatum techniques as required by the Project Instructions. However, if it is deemed necessary to change the water level reduction method to discrete zoning the following additional information may be useful:

1) The National Water Level Observation Network (NWLON) station serving as datum control for this survey began as Springmaid Pier, SC (8661070). The Springmaid Pier station was destroyed in Hurricane Matthew before acquisition for H12934 was complete, therefore all data has been tide corrected using the Wrightsville Beach, NC station (8658163) for datum control.

2) A request for final approved tides was sent to COOPS on (12 December, 2016) . The final tide note was received on (20 December, 2016).

3) The submitted tide corrector (OPR-G309-FH-2016_Revised3) is the revised zoning file that was accepted as final for Wrightsville Beach, NC (8658163) per final tide note, submitted in Appendix I. This file has been loaded to all CARIS lines submitted in H12934. The verified water level file (8658163.tid) has been loaded for all data, but not applied in the final merge of data. GPS tides were applied in the final merge of all data as required for ellipsoidally referenced surveys.

D. Results and Recommendations

D.1 Chart Comparison

The hydrographer has compared a sounding plot from the surveyed area to the charted soundings. Additionally, a Chart Comparison Tool contained in the QC Tools utility under PydroExplorer was run to compare the most recent large scale ENC (US3SC10M) to processed sounding data and the S-57 Final Feature File. There are no charted contours to compare.

D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
11520	1:43720	45	09/2013	09/27/2016	10/08/2016

Table 12: Largest Scale Raster Charts

11520

Surveyed soundings from H12934 agree with 11520 charted depths within one fathom.

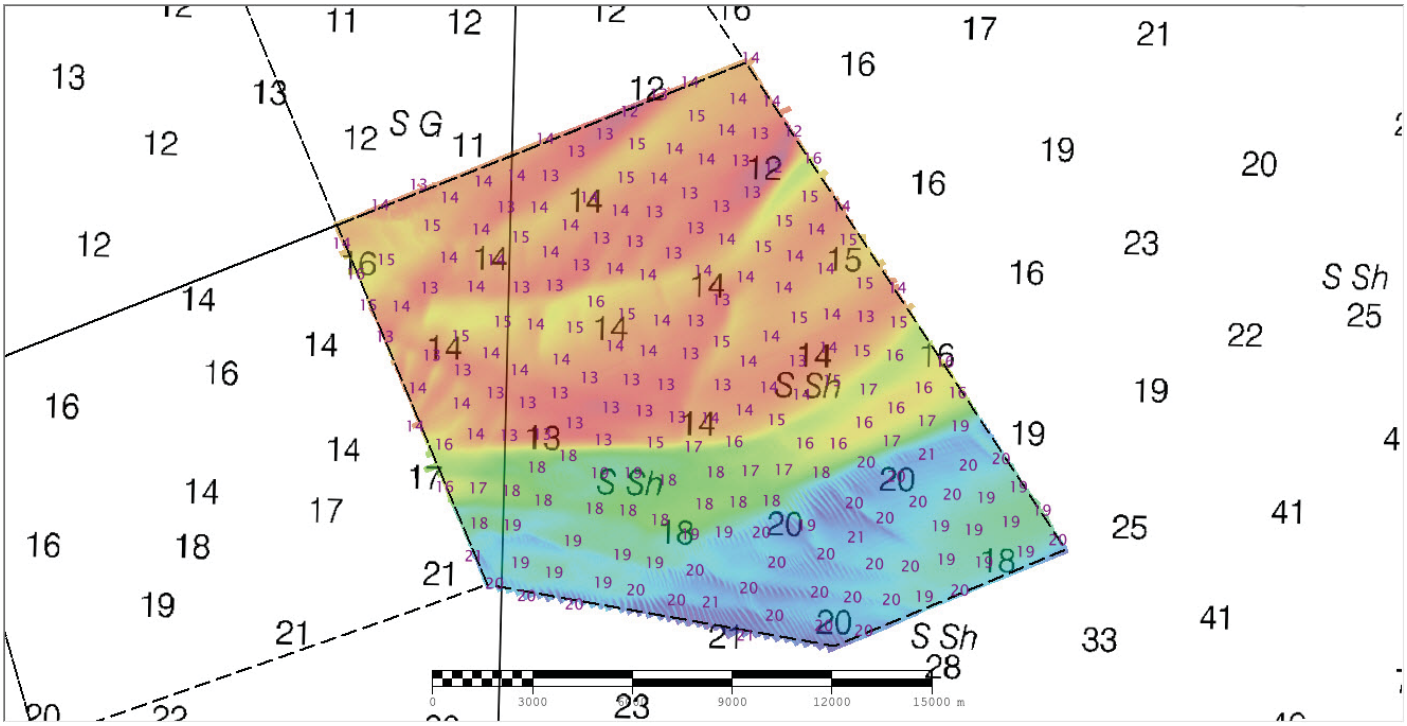


Figure 18: Chart 11520 comparison (Soundings are in fathoms)

D.1.2 Electronic Navigational Charts

The following are the largest scale ENCs, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3SC10M	1:432720	21	09/15/2014	10/06/2016	NO

Table 13: Largest Scale ENCs

US3SC10M

Surveyed soundings from H12934 agree with US3SC10M charted depths within one fathom.

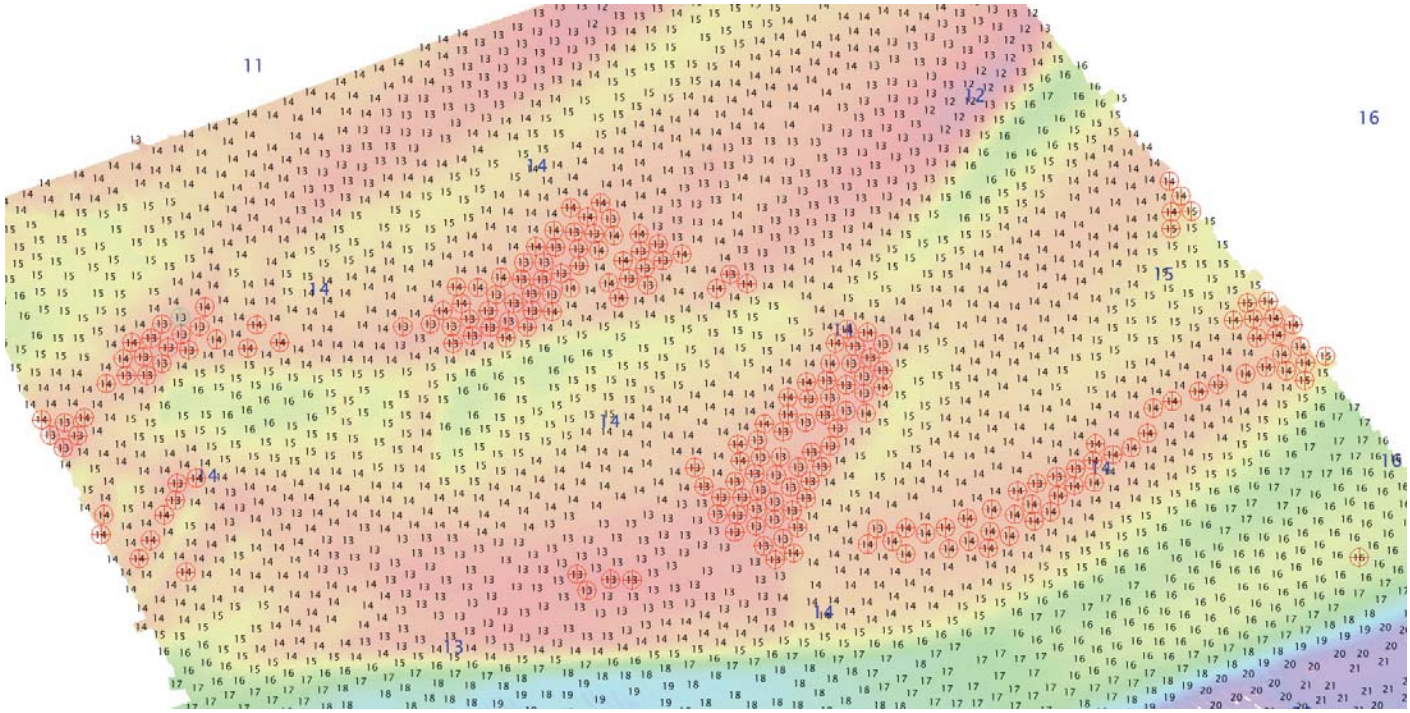


Figure 19: ENC US3SC10M Comparison (Soundings are in fathoms)

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

No charted features exist for this survey.

D.1.5 Uncharted Features

No uncharted features exist for this survey.

D.1.6 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.8 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

D.1.9 Bottom Samples

Three (3) bottom samples were acquired for this survey. Two (2) additional bottom sample was attempted but no sample was recovered. Per Section 7.5 of the 2016 HSSD these have been included in the final feature file with NATSUR (nature of surface) attribution of "unknown." See final feature file for more information.

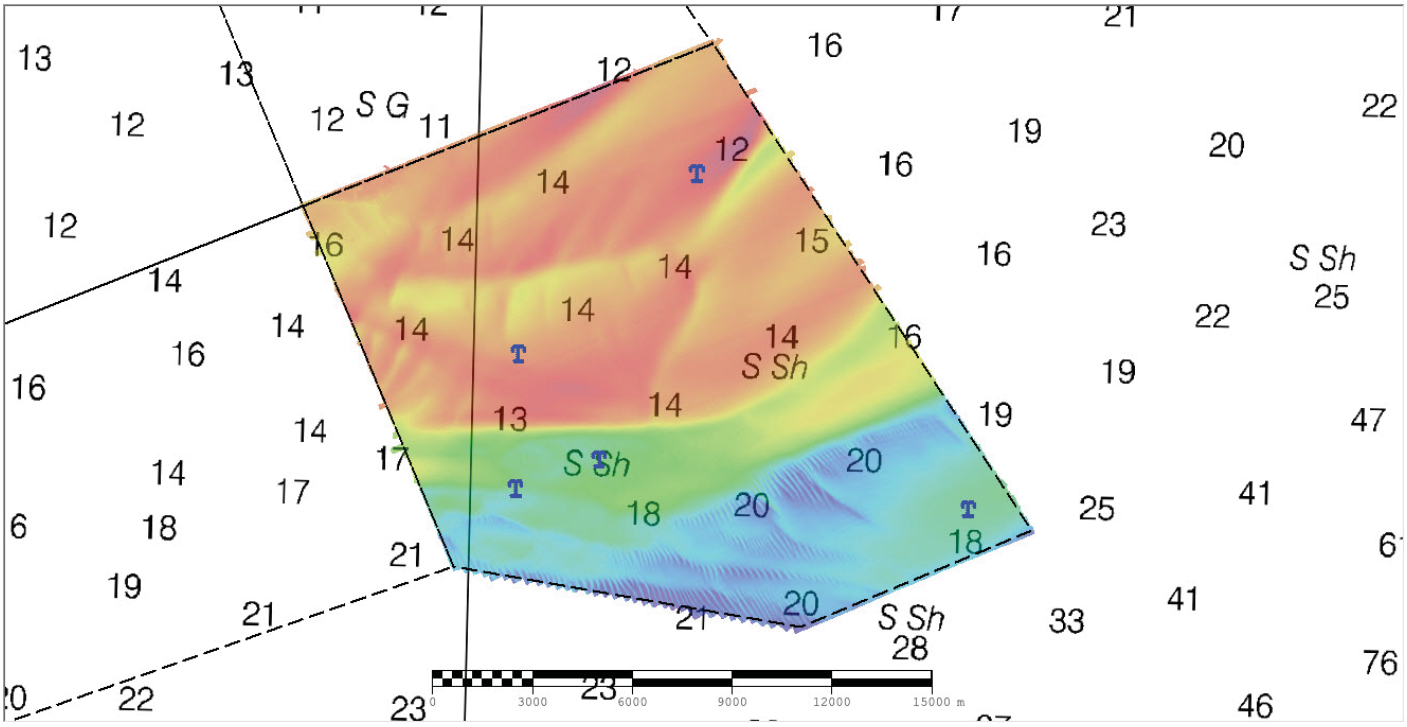


Figure 20: Bottom Samples for H12934

D.2 Additional Results

D.2.1 Shoreline

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

No Aids to navigation (ATONs) exist for this survey.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No Significant Features exist for this survey.

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits.

D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

D.2.11 Inset Recommendation

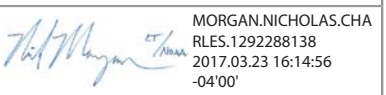
No new insets are recommended for this area.

E. Approval Sheet

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Approver Name	Approver Title	Approval Date	Signature
LCDR Matthew Jaskoski, NOAA	Chief of Party	02/03/2017	
LT Nicholas Morgan, NOAA	Field Operations Officer	02/03/2017	 MORGAN.NICHOLAS.CHARLES.1292288138 2017.03.23 16:14:56 -04'00'
LCDR Jonathan French, NOAA	Sheet Manager	02/03/2017	

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference Staiton
CTD	Conductivity Temperature Depth
CEF	Chart Evaluation File
CSF	Composite Source File
CST	Chief Survey Technician
CUBE	Combined Uncertainty and Bathymetry Estimator
DAPR	Data Acquisition and Processing Report
DGPS	Differential Global Positioning System
DP	Detached Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
FFF	Final Feature File
FOO	Field Operations Officer
FPM	Field Procedures Manual
GAMS	GPS Azimuth Measurement Subsystem
GC	Geographic Cell
GPS	Global Positioning System
HIPS	Hydrographic Information Processing System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Survey Specifications and Deliverables

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
HSX	Hypack Hysweep File Format
HTD	Hydrographic Surveys Technical Directive
HVCR	Horizontal and Vertical Control Report
HVF	HIPS Vessel File
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
ITRF	International Terrestrial Reference Frame
LNM	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	Notice to Mariners
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRT	Navigation Response Team
NSD	Navigation Services Division
OCS	Office of Coast Survey
OMAO	Office of Marine and Aviation Operations (NOAA)
OPS	Operations Branch
MBES	Multibeam Echosounder
NWLON	National Water Level Observation Network
PDBS	Phase Differencing Bathymetric Sonar
PHB	Pacific Hydrographic Branch
POS/MV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
PPP	Precise Point Positioning
PPS	Pulse per second

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPE	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United Stated Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positiong System timing message
ZDF	Zone Definition File

APPENDIX I
TIDES AND WATER LEVELS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
<Unknown 'Field Unit' (Pydro: Config...PSS Metadata)>

December 12, 2016

MEMORANDUM FOR: Gerald Hovis, Chief, Products and Services Branch, N/OPS3

FROM: <Unknown 'Field Unit' and/or 'Lead Hydrographer' (Pydro: Config...PSS Metadata)>

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final zoning in MapInfo and .MIX format
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

Atlantic Hydrographic Branch (N/CS33)
439 West York St
Norfolk, VA 23510

NOAA Ship FERDINAND R. HASSLER (MOA-FH)
29 Wentworth Road
New Castle, NH 03854

These data are required for the processing of the following hydrographic survey:

Project No.:	OPR-G309-FH-16
Registry No.:	H12934
State:	North Carolina
Locality:	Approaches to Wilmington, NC.
Sublocality:	11 Miles southeast of Frying Pan Shoal

Attachments containing:

1) an Abstract of Times of Hydrography,
2) digital MID & MIF files of the track lines from Pydro

cc: N/CS33

Year_DOY	Min Time	Max Time
2016_264	04:48:40	23:50:04
2016_265	00:06:46	23:53:05
2016_266	00:10:42	23:53:03
2016_267	00:13:24	23:53:02
2016_268	00:14:18	23:53:14
2016_269	00:24:33	23:59:58
2016_270	00:00:02	03:28:50
2016_295	14:49:58	22:14:33

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : December 16, 2016

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-G309-FH-2016_Revised3
HYDROGRAPHIC SHEET: H12934

LOCALITY: 11 miles Southeast of Frying Pan Shoal, NC
TIME PERIOD: September 20 - October 21, 2016

TIDE STATION USED: 8658163 Wrightsville Beach, NC
Lat. 34° 12.8'N Long. 77° 47.2' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.206 meters

ESTIMATED ZONING ERROR: 0.37 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA109A and SA110

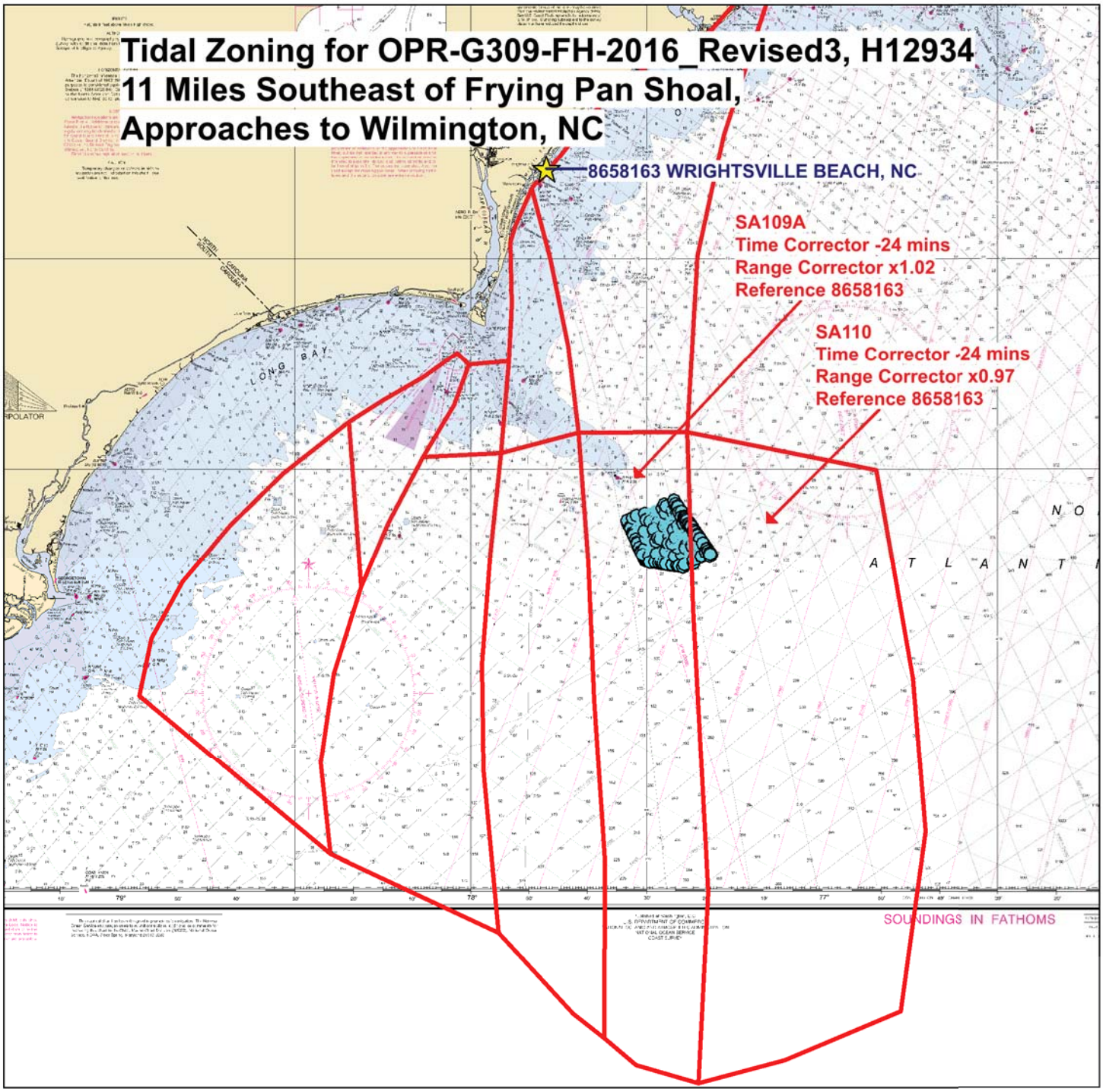
Refer to attachments for zoning information.

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).

HOVIS.GERALD.THOMAS.JR.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.JR.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.JR.1365860250
Date: 2016.12.20 11:17:36 -05'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Tidal Zoning for OPR-G309-FH-2016_Revised3, H12934
11 Miles Southeast of Frying Pan Shoal,
Approaches to Wilmington, NC
8658163 WRIGHTSVILLE BEACH, NC
SA109A
Time Corrector -24 mins
Range Corrector x1.02
Reference 8658163
SA110
Time Corrector -24 mins
Range Corrector x0.97
Reference 8658163
LONG BAY
A T L A N T
SOUNDINGS IN FATHOMS

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

Hydro Hot List request, OPR-G309-FH-16

6 messages

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Sat, Jul 9, 2016 at 6:01 AM
To: _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>
Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning,

NOAA Ship *Ferdinand Hassler* is scheduled to begin survey operations on OPR-G309-FH-16 on July 12th, 2016. Please add the following station to the Hydro Hot List for OPR-G309-FH-16:

8661070 - Springmaid Pier, SC

V/r
Nick Morgan

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

Hua Yang - NOAA Affiliate <hua.yang@noaa.gov> Mon, Jul 11, 2016 at 7:54 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning Nick,

The station was just added to the Hydro Hot List. Thank you for your timely notice.

Have a good survey,

Hua Yang

Hydrographic Planning Team
NOAA/National Ocean Service
Center for Operational Oceanographic Products and Services
Station 7128
1305 East West Highway, SSMC4
Silver Spring, MD 20910
Office: 240-533-0612
Email: Hua.Yang@noaa.gov
Web: http://tidesandcurrents.noaa.gov/

Hydro Hot List: http://tidesandcurrents.noaa.gov/hydro.shtml

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Mon, Jul 11, 2016 at 9:59 AM
To: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>
Cc: _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Thank you very much!

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Tue, Aug 23, 2016 at 1:01 PM
To: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>
Cc: _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Good morning,

I've noticed some voltage issues showing up on the Springmaid Pier tide station. I just wanted to check in to make sure that the station is operating correctly.

Thank you,
-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

Colleen Fanelli - NOAA Federal <colleen.fanelli@noaa.gov> Tue, Aug 23, 2016 at 1:46 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>, _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Nick,

Our field office visited the station today and replaced a blown fuse and a battery. The power system is back to working as expected. Thank you.

~Colleen

--
Colleen Fanelli
Oceanographer, Hydrographic Planning Team Lead
NOAA/National Ocean Service
Center for Operational Oceanographic Products and Services
Station 7127
1305 East-West Highway N/OPS3
Silver Spring, MD 20910
Colleen.Fanelli@noaa.gov
Phone (NEW): (240) 533 - 0615

Compare the meteorologist with his or her oceanographer colleague: the oceanographer may spend many years planning a campaign of observations of currents, temperature and salinity in a tiny area of the ocean, many weeks of discomfort on a ship taking the observations and several years analysing them back at the laboratory. All of this work is done for the research meteorologist, several times a day on a global basis, who merely has to read the numbers from an archive and construct whatever diagnostic quantity is required.
--Ian N. James, Introduction to Circulating Atmospheres
[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Tue, Aug 23, 2016 at 1:57 PM
To: Colleen Fanelli - NOAA Federal <colleen.fanelli@noaa.gov>

Cc: Hua Yang - NOAA Affiliate <hua.yang@noaa.gov>, _NOS CO-OPS OET Team <nos.coops.oetteam@noaa.gov>, "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Great, thanks!

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Tue, Aug 23, 2016 at 1:57 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> [Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

CORMS Morning Report - Wednesday, August 24, 2016

1 message

CORMS Operations <corms@noaa.gov> Wed, Aug 24, 2016 at 7:52 AM
To: Morning Report <nos.co-ops.cormsmorningreport@noaa.gov>
Cc: corms@noaa.gov

CORMS Morning Report

Wednesday, August 24, 2016

ALL WATER LEVEL STATION OUTAGES (missing all data for more than 3 days)

None.

NWLON STATION ISSUES

8658120 Wilmington (all data) was stopped from 1155 to 1409 UTC 08/23, for maintenance.

8661070 Springmaid Pier (all data) was stopped at 1607 UTC 08/23, for maintenance. A1-DCP1 water level, wind & air press were restarted at 1745 UTC 08/23, after maintenance and review. Water & air temps remain stopped for suspect data.

Great Lakes Water Level 7-Day Summary

Pass.

MAPPING/CHARTING STATION ISSUES

8418150 Portland (all DCP's) appears suspect at 1248 UTC 08/22. All data was stopped from 1714 to 1918 UTC 08/23, for maintenance.

8661070 Springmaid Pier L2 is above 60 V until 0630 UTC 08/23 and then returned to normal. L1 appears normal. All DCP's appear missing from 0606 to 1642 UTC 08/23 and suspect (spiking) at 1648 08/23.

8741533 Pascagoula NOAA Lab L2 is below 12.5 V until 1242 UTC 08/23 and after 2354 UTC 08/23. L1 appears normal.

9463502 Port Moller (all DCP's) has several periods of intermittent data.

9464212 Village Cove water levels (all DCP's) are suspect.

PARTNER STATION ISSUES

9414575 Coyote Creek Y1-DCP1 water level is suspect (spiking) from 2100 to 2200 UTC 08/23.

9752619 Isabel Segunda, Vieques Island (PRSN) L2 is missing. L1 appears normal.

9753216 Fajardo (PRSN) L2 is missing. L1 appears normal. All DCP's appear missing from 0854 to 1130 UTC 08/23.

9754228 Yabucoa Harbor (PRSN) L2 is missing. L1 appears normal.

9757112 Caja de Muertos (PRSN) L2 is missing. L1 appears normal.

9757809 Arecibo (PRSN) L2 is missing. L1 appears normal.

9759412 Aguadilla (PRSN) (all) did not update.

9761115 Barbuda water levels (except T1-DCP1) are suspect (not following predictions).

TCOON STATION ISSUES

8775237 Port Aransas (TCOON) (all sensors) was stopped at 1704 UTC 08/23, for maintenance.

STATIONS IN HIGH WATER CONDITION

None.

PORTS ISSUES

Chesapeake Bay

8573364 Tolchester Beach C1-DCP1 wind was switched to primary at 1448 UTC 08/23, after suspect data ended and review.

Lower Columbia River

9440569 Skamokawa N1-DCP1 water level was stopped from 1720 to 2303UTC 08/23, for maintenance.

Voice/Text

St. Charles Parish Project VOICE remains out of service.

For an updated list of current PORTS outages or maintenance, click on the CORMS Instrument Status Page link: https://corms.nos.noaa.gov/instrument_status.html

TSUNAMI REPORTS

None.

OPERATIONAL FORECAST SYSTEMS

No problems.

IT OPERATIONS

The PORTS Stations Monitor page for cb0201 York Spit LBB 22 current meter is showing no data, and it appears to be stuck at 1747 UTC 05/09/16.

SIGNIFICANT COASTAL WEATHER EVENTS

Gale Warnings are posted along southwest Alaska. High Surf Advisories are in effect for American Samoa.

TROPICAL OUTLOOK

Atlantic, Caribbean Sea, and Gulf of Mexico

At 0900 UTC 08/24, Tropical Storm Gaston was located about 975 miles west of the Cabo Verde Islands and was moving west-northwest at 15 knots. Maximum sustained winds were 60 knots with gusts to 75 knots. There are no coastal watches or warnings in effect.

A broad area of low pressure located near the southernmost of the Leeward Islands has a medium (50%) chance of becoming a tropical cyclone during the next 48 hours.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

Eastern Pacific

An area of low pressure located about 350 miles south-southwest of Manzanillo, Mexico has a high (80%) chance of becoming a tropical cyclone during the next 48 hours.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

Central/Western Pacific

At 0900 UTC 08/24, Tropical Depression 14W was located about 500 miles north of Guam and was moving north at 21 knots. TD 14W is moving away from the Marianas. There are no coastal watches or warnings in effect.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

OPERATIONS STAFF

Carnel Banks / Molly Smith

Continuous Operational Real-time Monitoring Service

NOAA/NOS/CO-OPS/OD/PMAB/DMAT/CORMS

http://tidesandcurrents.noaa.gov

301-713-2540 (desk)

301-758-4080 (cell)

1-800-For-NOAA

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

CORMS Morning Report - Sunday, October 09, 2016

1 message

CORMS Operations <Corms@noaa.gov> Sun, Oct 9, 2016 at 7:51 AM
To: Morning Report <nos.co-ops.cormsmorningreport@noaa.gov>
Cc: corms@noaa.gov

CORMS Morning Report

Sunday, October 09 , 2016

ALL WATER LEVEL STATION OUTAGES (missing all data for more than 3 days)

9753216 Fajardo (PRSN) last updated at 2100 UTC 09/28.

NWLON STATION ISSUES

9419750 Crescent City (all) was restarted at 1542 UTC 10/08, after maintenance and review.

Great Lakes Water Level 7-Day Summary

Passed.

MAPPING/CHARTING STATION ISSUES

8661070 Springmaid Pier (all) is missing after 1600 UTC 10/08. All data was stopped at 1852 UTC 10/08, after being notified site was destroyed.

8670870 Fort Pulaski (all) is mostly missing from 0818 to 2242 UTC 10/08. Winds were stopped at 0100 UTC 10/09, for suspect data.

8720030 Fernandina Beach Y1-DCP1 water level was switched to primary at 1221 UTC 10/08, after suspect data ended.

8720218 Mayport (Bar Pilots Dock) (all) is missing from 0206 to 0230 UTC 10/08.

8720226 Southbank Riverwalk, St Johns River (all) has frequent brief periods of missing data.

8727520 Cedar Key A1-DCP1 water level did not update. B1-DCP2 water level updated normally.

9464212 Village Cove, St Paul Island (all) is missing from 0424 to 0454 UTC 10/08.

PARTNER STATION ISSUES

9752619 Isabel Segunda, Vieques Island (PRSN) L2 is missing. L1 appears normal.

9753216 Fajardo (PRSN) (all) did not update.

9754228 Yabucoa Harbor (PRSN) L2 is missing. L1 appears normal.

9757112 Caja de Muertos (PRSN) (all) is missing except from 1330 to 2200 UTC 10/08. L2 is missing. L1 appears normal.

9757809 Arecibo (PRSN) L2 is missing. L1 appears normal.

9759412 Aguadilla (PRSN) (all) did not update.

9761115 Barbuda water levels (except T1-DCP1) are suspect (not following predictions).

TCOON STATION ISSUES

None.

STATIONS IN HIGH WATER CONDITION

Numerous stations from northeast Florida to Ocean City, Maryland and:

9468333 Unalakleet

9468756 Nome, Norton Sound

9491094 Red Dog Dock

PORTS ISSUES

Jacksonville

8720228 Little Jetties visibility was restarted at 0240 UTC 10/09, after suspect data ended.

Lake Charles

8767816 Lake Charles B1-DCP2 water level was switched to primary at 0750 UTC 10/09, for suspect A1-DCP1 water level.

Savannah

8670674 Talmadge Memorial Bridge air gap was stopped at 2200 UTC 10/08, for suspect data.

Voice/Text

St. Charles Parish Project VOICE remains out of service.

For an updated list of current PORTS outages or maintenance, click on the CORMS Instrument Status Page link:
https://corms.nos.noaa.gov/instrument_status.html

TSUNAMI REPORTS

None.

OPERATIONAL FORECAST SYSTEMS

No problems.

IT OPERATIONS

No problems.

SIGNIFICANT COASTAL WEATHER EVENTS

Gale and Storm Warnings are in effect for coastal waters of southwest Alaska, Bristol Bay, the Alaskan Peninsula, and Aleutian Islands. High Surf Advisories are in effect for north and west facing shores in Hawaii. Gale Warnings are in effect for most all of the Chesapeake Bay and tidal tributaries. Coastal Flood Warnings and High Surf Advisories are posted for southeast Virginia areas adjacent to the Atlantic Ocean, southern Chesapeake Bay, and tidal tributaries. Coastal Flood Watches and High Surf Advisories are also in effect from the Outer Banks of North Carolina to the eastern shore of Maryland. Coastal Flood Warnings are also in effect for northeast Florida. Also, please see Tropical Outlook section below.

TROPICAL OUTLOOK

Atlantic, Caribbean Sea, and Gulf of Mexico

At 0900 UTC 10/09, Post Tropical Cyclone Matthew was located about 30 miles southeast of Cape Hatteras, North Carolina and was moving east at 12 knots. Maximum sustained winds were 65 knots with gusts to 80 knots. Hurricane Watches and Tropical Storm Warnings are posted from coastal North Carolina including Pamlico and Albemarle Sounds.

At 0900 UTC 10/09, Tropical Storm Nicole was located about 555 miles south of Bermuda and was nearly stationary. Maximum sustained winds were 45 knots with gusts to 55 knots. There are no coastal watches or warnings in effect.

Elsewhere, tropical cyclone formation is not expected during the next 48 hours.

Eastern Pacific

Tropical cyclone formation is not expected during the next 48 hours.

Central/Western Pacific

Tropical cyclone formation is not expected during the next 48 hours.

OPERATIONS STAFF

Andrew Jakubowski / Tim Gibson

Continuous Operational Real-time Monitoring Service

NOAA/NOS/CO-OPS/OD/PMAB/DMAT/CORMS

http://tidesandcurrents.noaa.gov

301-713-2540 (desk)

301-758-4080 (cell)

1-800-For-NOAA

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

Fwd: Wilmington Bottom Sample Guidance

7 messages

Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov> Sat, Oct 1, 2016 at 10:55 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

---------- Forwarded message ----------
From: **Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>
Date: Sat, Oct 1, 2016 at 10:39 AM
Subject: Wilmington Bottom Sample Guidance
To: Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>
Cc: Ashley Chappell - NOAA Federal <ashley.chappell@noaa.gov>

OPS,

Here is the guidance for the next set of the Wilmington bottom samples, and some other useful documents. Please let me know what you think, and add to this. The main changes are recording the position of the camera, and guidance on what to send to Chris and I. This is a starting place, incorporating what feedback I received from the first round.

We are going to get drop cameras for the fleet. I am was thinking we could send these documents and any resulting SOP with the drop cameras.

In addition to this guidance we would like to hear your feedback on the operation of the drop camera. Please send that review to me and Juliet and I.

It was also recommended we incorporating Coastal and Marine Ecological Classification Standard (CMECS) into our classification methodology. We are still looking into that, but if you are interested more information is at: https://www.cmecscatalog.org/.

Thank you,
Starla

--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: In-House Planned Hydrographic Surveys -2016

--
LT Nick Morgan, NOAA
Operations Officer
NOAA Ship Ferndiand R. Hassler

***Physical Address** (UPS/FedEx):*
UNH Judd Gregg Marine Research Complex
29 Wentworth Rd.
New Castle, NH 03854

***Mailing Address**:*
PO Box 638

New Castle, NH 03854

Ship's landline: 603-431-4500
Ship's cell: 603-812-8748
Cell Phone: 907-617-0963

Bottom_Sample_Guidance.zip
10828K

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Wed, Nov 9, 2016 at 5:11 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Hello FH Folk,

As you make your triumphant return, I want to remind you that we would like the additional bottom characteristic products listed in the attached guidance package.

Please make the mosaics at the same resolution the bathymetry, and record the processing times in the backscatter metrics log.

Please copy this email and documents into your correspondence folder.

Thank you,
Starla

---------- Forwarded message ----------
From: **Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>
Date: Sat, Oct 1, 2016 at 10:39 AM
Subject: Wilmington Bottom Sample Guidance
To: Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>
Cc: Ashley Chappell - NOAA Federal <ashley.chappell@noaa.gov>

OPS,

Here is the guidance for the next set of the Wilmington bottom samples, and some other useful documents. Please let me know what you think, and add to this. The main changes are recording the position of the camera, and guidance on what to send to Chris and I. This is a starting place, incorporating what feedback I received from the first round.

We are going to get drop cameras for the fleet. I am was thinking we could send these documents and any resulting SOP with the drop cameras.

In addition to this guidance we would like to hear your feedback on the operation of the drop camera. Please send that review to me and Juliet and I.

..

Thank you,
Starla

--
Starla D. Robinson, Physical Scientist

NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Bottom_Sample_Guidance.zip
10828K

Michael White - NOAA Affiliate <michael.white@noaa.gov> Thu, Nov 10, 2016 at 9:19 AM
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>

Hi All,

The mosaics were currently being gridded at 4 meter cells. Likely the data will support finer resolutions, but it is not what the SOP instructs. The SOP states, "The final exported Mosaic (.tiff) will be approximately 5% of the Mosaic Memory used in FMGT by a single tile...If the export exceeds 20MB, use a coarser resolution." For the attached spreadsheet I would suggest having two more columns labeled "Mosaic Memory" and "Pixel Size."

Additionally:

1) The default range of the FMGT histogram is 10 to -70. Typically mosaics will only populate part of this range. If the processor resets the bounds of the histogram to match the spread of the created mosaic and *then* exports the TIFF, the resulting mosaic will have better contrast and look less "grayed out."

I placed two examples in: R:\Temporary_Fledermaus_Projects\H1229_S250Port_400kHz.fmproj\Output\SD

2) In FMGT under the Settings tab -> Processing Parameters there is a window to set the acquisition system. By selecting, "Reson 2175" the default setting will fill in for all of the fields. These can be adjusted to match the true values for each head, but having the defaults set will likely result in better mosaics. This is not in the SOP.

For the operation of the bottom camera and sediment samples:

Along with the images from the bottom sampler, Cody and I were taking images on deck of the samples and storing them in the Multimedia folder. These may be useful for additional characterization/verification of the sediment characterization. We might want to consider keeping them with the bottom sample images. I would say the bottom sample images are better at showing the in situ bottom type (ripples, bio cover, large clasts) compared to capturing fine scale sediment size. Chris Taylor may have more to say from a habitat perspective. I will attach examples.

Currently the plan is attaching one image to each sample. Do we have guidelines to choose the image? I.e. what makes one image better than the others. Attached are the images from Samples 4, 5 and 6

Examples.zip

for H12930. Some show the bottom type, some a close up of the sediment and the hand sample. If we attach one image, which image?

The grab sampler also seems to take more reliable samples when the camera is attached. When the camera was not operational, we had several stations without samples but always got a sample with the device attached. Even if the camera is not working, may be worth have the device attached to the grabber.

Hope this input helps,

Mike White

[Quoted text hidden]

--

Michael P. White
Hydrographic Analyst (E.R.T., Inc.)
NOAA/CCOM Joint Hydrographic Center
UNH, Durham

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Thu, Nov 10, 2016 at 5:35 PM
To: Michael White - NOAA Affiliate <michael.white@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>
Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Good point Mike,

Looking back through my files I think we did 4 meter resolution backscatter as well. So please do not do any additional 2 meter mosaic creation until I can check in with Chris.

For the final product I have been asking for a non-stretched mosaic, because that is the easiest way to keep the range consistent between sheets. If we were to expand this requirements to other projects we would want to keep it standardized between platform/sonar units. I was stretching the grayscale contrast to do the bottom sample selection. If you were the customer, what would you find useful? Or would you rebuild mosaics from the raw data?

For the Final Features file you can connect multiple images. My suggestion is choose one that shows the substrate well, and one that shows the surrounding habitat, if it adds useful data. No more than 4 images, less is better. From a habitat point of view what do you think would be useful? This is not a rhetorical question, we could use the input.

The Wilmington project is a collaboration between HSD / NCCOS / and UNH-JHC-CCOM. We have been asking for additional products and ideas along the way so we could meet each group's needs; and explore different ways of doing things. Your input is essential. Any ideas or advice you can give, now is the time, so we can add it to our recommendations.

Thank you for making this project a reality!

- Starla

[Quoted text hidden]

Chris Taylor - NOAA Federal <chris.taylor@noaa.gov> Fri, Nov 18, 2016 at 8:00 AM
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: Michael White - NOAA Affiliate <michael.white@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Juliet Kinney - NOAA Affiliate <juliet.kinney@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

All,
Thanks for the update on this project and sorry for the delays in responding. I concur with all that Starla and Mike have presented regarding resolution for mosaics. We (NCCOS) appreciate the extra effort gathering and managing bottom sample/imagery. We look forward to reviewing the imagery and producing some preliminary seafloor characterization surfaces.
We look forward to collaborating with HSD and others on future projects where we are able to improve seafloor habitat mapping in concert with core mission objectives for OCS.

Regards,
Chris

[Quoted text hidden]

--

J. Christopher Taylor, PhD
National Centers for Coastal Ocean Science
@ NOAA's Beaufort Laboratory
101 Pivers Island Road, Beaufort, North Carolina 28516
O: +1 252 838 0833 M: +1 252 723 3993
Website: http://coastalscience.noaa.gov/

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Fri, Nov 18, 2016 at 6:29 PM
To: Chris Taylor - NOAA Federal <chris.taylor@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Adam Reed - NOAA Federal <adam.reed@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, Michael White - NOAA Affiliate <michael.white@noaa.gov>, Cody Guilday - NOAA Affiliate <cody.guilday@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

OPS,

Four meter backscatter mosaics, or whatever you used, are fine. How do we best get the data from you?

Thank you,
Starla
[Quoted text hidden]

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Wed, Dec 21, 2016 at 3:19 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Matthew Jaskoski - NOAA Federal <Matthew.Jaskoski@noaa.gov>, Nicholas Morgan - NOAA Federal <nicholas.morgan@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Briana Welton - NOAA Federal <briana.welton@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Hello Hassler,

Congratulations on pulling off another amazing and challenging year. What you have accomplished as a ship -especially a ship with no stable survey department- is impressive. I am singing your successes among the halls. I am currently writing up a project summary and I cannot wait to share it. That said....

I am looking through the preliminary bottom sample data, and I saw some things that need to be corrected before the finals are submitted. For example the S57 files have no reference to the sample site and there are no associated images, and the images in the folder do not follow naming convention. The bottom sample logs are not the version requested, they do not include the measurements from the camera face to the sampler, and they are incomplete. Given that the data was preliminary, a rushed request, and you may have corrected it already.

Again, attached is the official bottom sample guidance. Please ensure the sheet managers have this.This data will be testing our bottom image workflow from acquisition to NCEI and other data discovery platforms. It is important that the S57 files have correct attribution.

Thank you again,
Starla
[Quoted text hidden]

Bottom_Sample_Guidance.zip
10828K

OPS.Ferdinand Hassler - NOAA Service Account
<ops.ferdinand.hassler@noaa.gov>

Final Tide Notes for project OPR-G309-FH-2016_Revised3, Registry Nos. F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934

12 messages

Cristina Urizar - NOAA Federal <cristina.urizar@noaa.gov> Tue, Dec 20, 2016 at 1:31 PM
To: "CO.Ferdinand Hassler" <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler" <ops.ferdinand.hassler@noaa.gov>
Cc: "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Jerry Hovis <gerald.hovis@noaa.gov>, Corey Allen <corey.allen@noaa.gov>, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>, Castle E Parker <Castle.E.Parker@noaa.gov>, AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>

Dear FERDINAND HASSLER Operations Officer,

Attached is a zipped file containing the final tide files for project OPR-G309-FH-2016_Revised3, Registry Nos. F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934. Below is a description of those files. If you have any problems retrieving any of the information, please give me a call. The following files are included in the zipped attachment G309FH2016_Rev3_Zoning_and_Tide_Notes.zip for project OPR-G309-FH-2016, F00679, H12893, H12894, H12895, H12929, H12930, H12931, H12932, and H12934:

F00679Rev.pdf
H12893Rev.pdf
H12894Rev.pdf
H12895Rev.pdf
H12929.pdf
H12930.pdf
H12931.pdf
H12932.pdf
H12934.pdf
G309FH2016_Rev3_CORP.zdf

Note that the four (4) revised final tide notes for project OPR-G309-FH-2016_Revised3, Registry Nos. F00679, H12893, H12894 and H12895 are being issued to provide consistent final tidal zoning across the project. The final tide files included in this email apply to all tide notes also included in this email.

There are nine (9) final tide notes for OPR-G309-FH-2016_Revised3 in this email. Tide station data for Wrightsville Beach, NC (8658163) may be retrieved via the Internet from the CO-OPS website service at http://opendap.co-ops.nos.noaa.gov/axis/text.html. The *.pdf file is the tide note in Adobe Acrobat format with the graphic.

The following files are the MapInfo zoning files:

G309FH2016_Rev3_CORP.DAT
G309FH2016_Rev3_CORP.ID
G309FH2016_Rev3_CORP.IND
G309FH2016_Rev3_CORP.MAP
G309FH2016_Rev3_CORP.TAB
G309FH2016_Rev3_LABP.DAT
G309FH2016_Rev3_LABP.ID
G309FH2016_Rev3_LABP.MAP
G309FH2016_Rev3_LABP.TAB
G309FH2016_Rev3_STNP.DAT
G309FH2016_Rev3_STNP.ID
G309FH2016_Rev3_STNP.IND

G309FH2016_Rev3_STNP.MAP
G309FH2016_Rev3_STNP.TAB

Please e-mail me when you have captured all files successfully. Give me a call at 727-209-5954, if there are any problems.

--
Cristina Urizar
Oceanographer

National Oceanic and Atmospheric Administration
NOS/CO-OPS/Oceanographic Division
263 13th Avenue South, Rm. 302
St Petersburg, Florida 33701
Office: 727-209-5954
Cell: 301-325-6793

http://tidesandcurrents.noaa.gov

G309FH2016_Rev3_Zoning_and_Tide_Notes.zip
6604K

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Mon, Jan 9, 2017 at 1:14 PM
To: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>

Hi Starla,

CO-OPS has provided a revised zoning file for all of the surveys that were done pre-hurricane Matthew (H12893, 94, 95, and F00679). I was planning on doing a final shipboard review with the CO and Jeff Marshall when he comes out here over the next couple of weeks. Do we need to re-apply final tides using the new Wrightsville Beach, NC tide station that we swiched to Post-Hurricane Matthew? Or should we keep it using the Springmaid Pier, SC station? I guess the question is, do we want to submit all surveys using a single tide station or Springmaid for pre-Hurricane Matthew and Wrightsville for post-Hurricane Matthew?

Personally I don't really want to have to go in and re-apply tides to three surveys that we are close to sending off. But if we think this saves headaches down the line we can.

V/r
Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854
[Quoted text hidden]

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Mon, Jan 9, 2017 at 3:00 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>

I will look into it. I am CCing Corey and LT Quintero on this email.

[Quoted text hidden]

--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Mon, Jan 9, 2017 at 3:31 PM
To: cristina.urizar@noaa.gov
Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Hello Cristina,

I am the HSD project manager for OPR-G309-FH-2016. The first four surveys for the project were completed well before the hurricane. They are processed and nearly complete. Would it be possible to use the original Springmaid Pier, SC final water levels and zones for those four surveys? We would like a final tide note referencing Springmaid Pier, unless there is a compelling reason not to.

Thank you,
Starla

Note that the four (4) revised final tide notes for project OPR-G309-FH-2016_Revised3, Registry Nos. F00679, H12893, H12894 and H12895 are being issued to provide consistent final tidal zoning across the project. The final tide files included in this email apply to all tide notes also included in this email.

[Quoted text hidden]

--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Cristina Urizar - NOAA Federal <cristina.urizar@noaa.gov> Tue, Jan 10, 2017 at 9:05 AM
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Jerry Hovis <gerald.hovis@noaa.gov>

Good morning,

It was nice chatting with you yesterday afternoon, Starla. Below is a summary of our conversation.

Before I began working on the tide notes, Colleen reached out to Corey to discuss the various products HPT provided OCS (preliminary zoning and revised preliminary zoning) and how the files were labeled. In that conversation, Corey and Colleen agreed that the best way forward was for CO-OPS to deliver zoning based on Wrightsville Beach, NC that would be used to process all the data collected for G309 regardless of when it was collected (pre- or post-hurricane Matthew). This was to be done for three reasons:

1. The estimated error of the zoning based on Wrightsville Beach is less than the estimated error of the zoning based on Springmaid Pier.
2. To provide consistency across the project as a whole in the processing phase. Switching between control stations may introduce error.
3. To reduce any confusion regarding which files to use in the final processing of the data.

The tidal zoning provided in the previously delivered tide notes using Springmaid Pier as control (with Reg Nos. F00679, H12893, H12894 and H12895) was within OCS error tolerances.

Thank you,
Cristina

[Quoted text hidden]

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Thu, Jan 12, 2017 at 8:52 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Hello Nick,

Could you send us an estimate on how much time it would take to apply the Wrightsville Beach, NC tide station data to the three pre-hurricane surveys and the difference in uncertainty it will gain us?

Thank you,
Starla
[Quoted text hidden]
--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

OPS.Ferdinand Hassler - NOAA Service Account Thu, Jan 12, 2017 at 9:28 AM
<ops.ferdinand.hassler@noaa.gov>
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>

Starla,

We are reviewing all 3 of Jeff's surveys with the CO tomorrow. Do we want to go down this hole? This would be a big hold-up and we are trying to review these while Jeff is here and he's likely leaving this weekend. It appears that our ship won't be getting U/W for this habitat mapping leg (likely it seems right now at least). This is affording us a really good opportunity to get these surveys off the ship. It's hard to say how long it would take but applying the tides, merging, TPU....etc, recomputed surfaces and then making changes to the DRs. Maybe call it a week? Then we'd be kicking the review down the road. What would we really gain?

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> Thu, Jan 12, 2017 at 10:00 AM

To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Nick,

There's a lot going on over here, so I'm trying to sort out the exact state of things and haven't gotten far yet. My intention is to try and change things as little as possible once we start down a path; minimize changes to the PI and similarly minimize changes to the requests we send to CO-OPS. Stability breeds efficiency. It seems from a very brief chat with Starla that the agreement with CO-OPS may not have been communicated to her or to you, but using the older gauge causes non-trivial costs on other offices.

If you proceed with preliminary tides, CO-OPS will need to generate a new set of final tides and we all know how long that takes. AHB will need to apply them and do all of the processing that you would do if you just applied the final already given to you, and then AHB would need to check for any problems. This also gets a little odd as any data QC issues in the surfaces they created now may not have been there when you delivered it...they are now QCing their own product instead of yours.

As for the timeline, I think a week is grossly inflated if getting this off is a priority. How many places in the DR does this exist? By memory I can think of one; updating this is a 15 minute job total for all 3 surveys. It's not much different than fixing a typo or some verbiage the CO doesn't like that's identified during the review. In fact, there is no real reason to fix it before the review; just note that it will be changed.

Apply Tides, Merge, and TPU surely take less than 3 hours total. Caris doesn't multithread efficiently unless something has changed a lot in Caris 10 and the network is the primary bottleneck on most ships, so you can run all 3 surveys on one machine or just use more than one computer, set them all to go, and come back at the end of the workday. I'm certain they would be done.

Save a copy of the current surfaces, difference the new one to highlight any major changes. That's a 20 minute process max, plus 30 for scanning the surfaces for changes.

You can also proceed with the survey review simply knowing that this process is pending, and with the expectation that any big changes get brought to the FOO/CO's attention. 99.5% of the content in the DR and the FFF will be unchanged, and the bathy should improve if anything.

If we failed to communicate the change in tide station to you, I can certainly appreciate your frustration and I apologize. However, the right answer here isn't kicking the can down the pipeline for someone else to fix, and the most efficient fix is to fix it now, on the ship.

V/r,
Russ

Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030
[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Thu, Jan 12, 2017 at 10:13 AM
To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>

Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Hi Russ,

Just FYI we had received final tides for Springmaid Pier (the original gauge) long ago. So these three surveys already have final tides applied but from Springmaid Pier.

-V/r
NIck

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> Thu, Jan 12, 2017 at 10:20 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Yeah, I'm on the phone with CO-OPS right now and they just told me that.

I'll get back to you shortly.

Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

[Quoted text hidden]

Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> Thu, Jan 12, 2017 at 10:28 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Just got off the phone with CO-OPS. I was incorrectly under the assumption that you had only preliminary from the original gauge that was taken out during the hurricane.

These four have final tides for both stations. The uncertainty is slightly lower using Wrightsville, but Springmaid is in spec and can be used if it's more convenient.
F00679
H12893
H12894
H12895

These have survey before and after the hurricane and must use the Wrightsville gauge.
H12929
H12930
H12931

H12932
H12934

Hopefully that helps you get these off the ship.

R/
Russ

Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account Thu, Jan 12, 2017 at 10:38 AM
<ops.ferdinand.hassler@noaa.gov>
To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Great, thanks Russ. It will definitely help. I know a week was probably exaggerating but the way things go on this ship any derailment when making good progress can turn into a lot of time letting a survey sit because nobody is here to work on it. So I was exaggerating because we don't have a designated person to work on it once Jeff leaves.

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

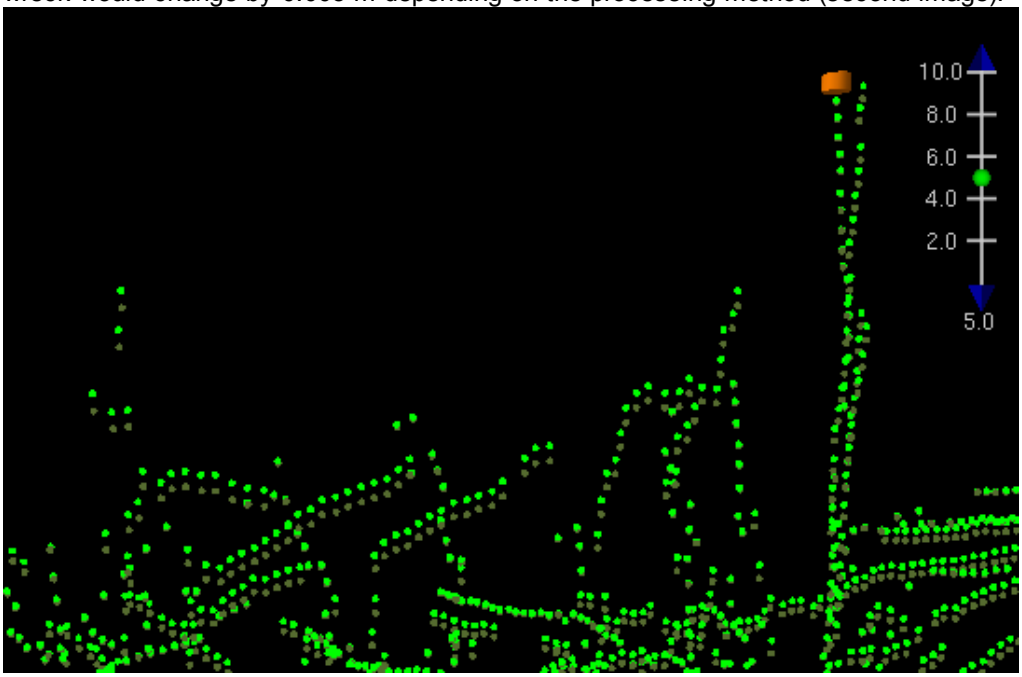
James Miller - NOAA Federal <james.j.miller@noaa.gov>

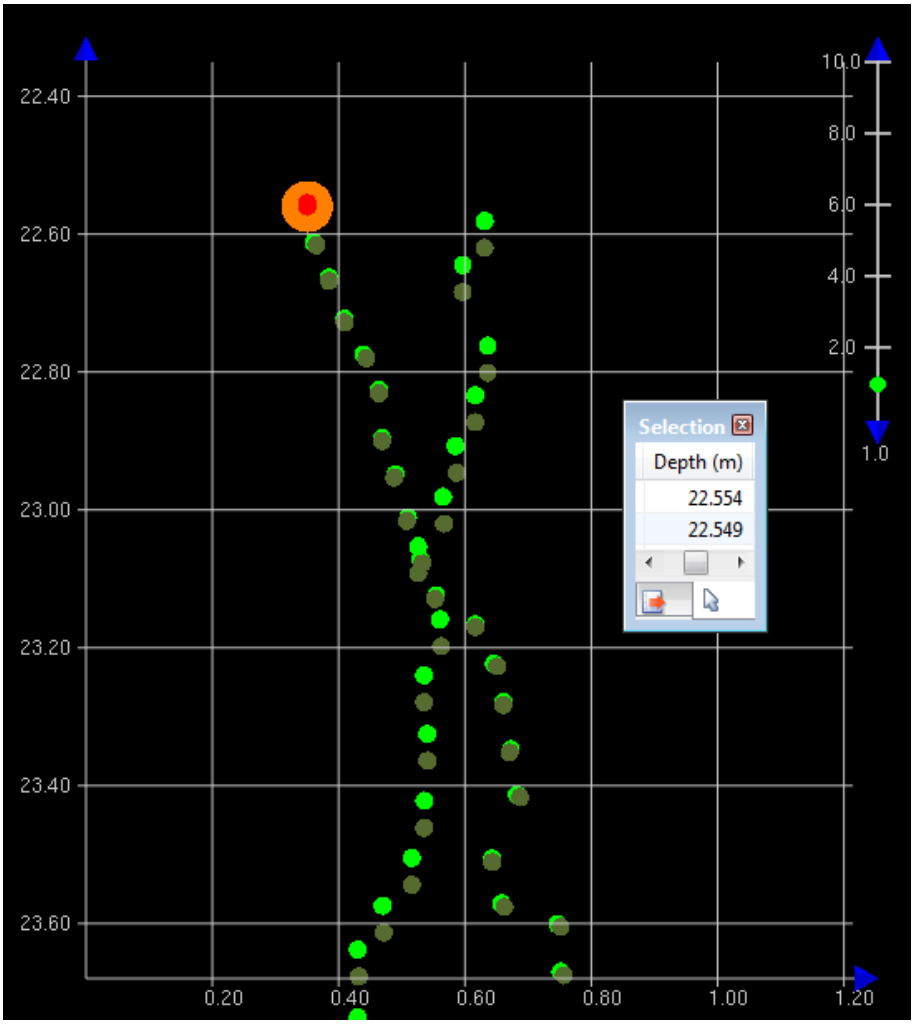
Project workflow for processing

James J. Miller <james.j.miller@noaa.gov> Thu, Feb 9, 2017 at 12:35 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi all,
>
> After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).
>
> I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.
>
> Looking at the data in subset, there was little to no difference between the two projects.

After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!

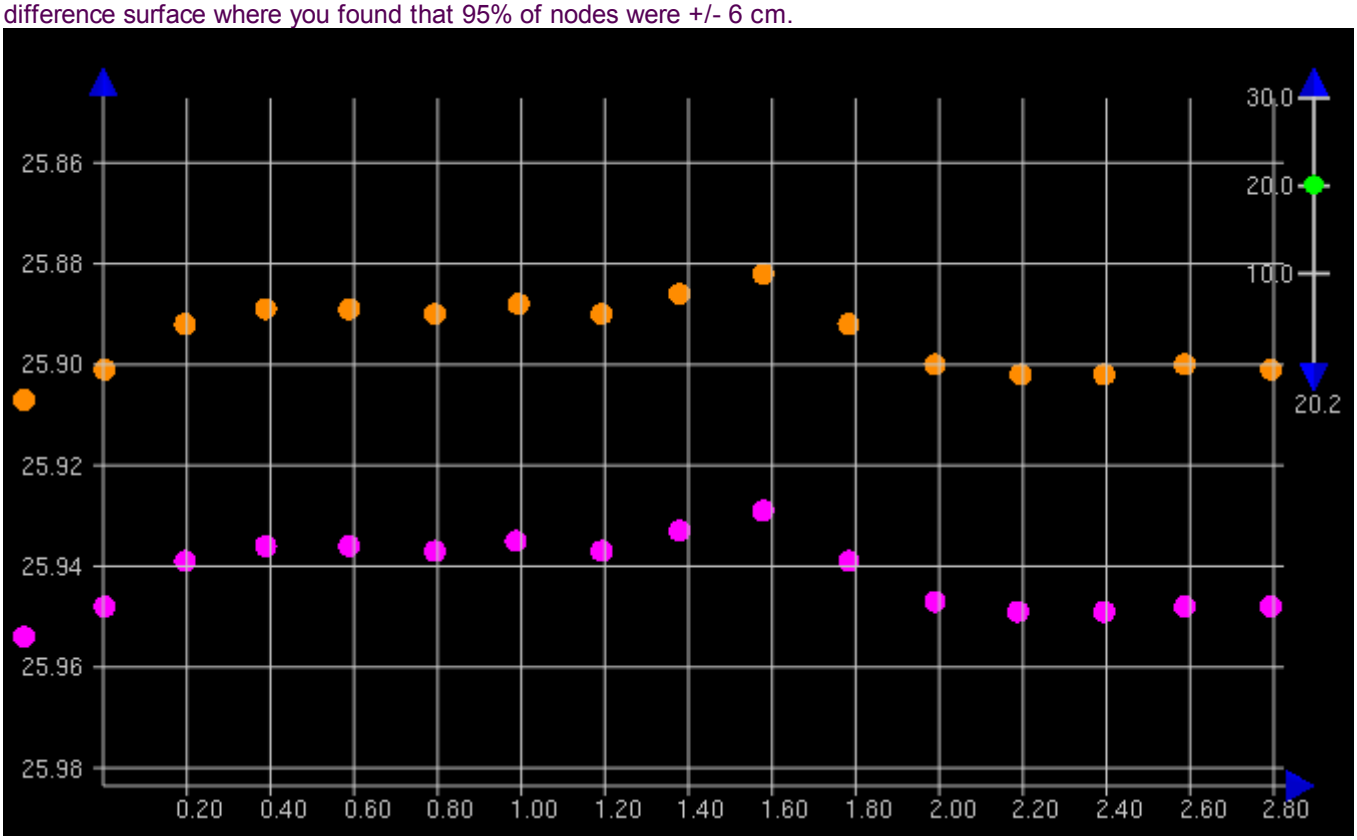
You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.

Hope this all helped.

Cheers,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi Clint,
>
> Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.
>
> Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.



> I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.
>
> James J. Miller
> Physical Scientist

NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi Nick,
With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi everyone,

Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings,

and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.

To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
<2017-02-08_17-14-54.png>

Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Hi Starla,
>
> I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
>
> Let us know if you or HSD has any thoughts or recommendations on this.
>
> Thanks,
> -Nick
>
> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hey Nick,
Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
>
> -Nick
>
> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:
>
> > Hi all,
> >
> > As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
> >
> > Tyanne
> >
> > On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.
> > >
> > > Cheers,
> > >
> > > Clint Marcus
> > > Physical Scientist
> > > NOAA Office of Coast Survey
> > > Atlantic Hydrographic Branch
> > > Phone: (757) 441-6746 ext 208
> > > Cell: (541) 264-6406
> > >
> > > On Tue, Feb 7, 2017 at 2:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> > >
> > > > Hi Clint,
> > > >
> > > > We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.

Anyways, James Miller is currently inquiring with Caris.

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Tue, Feb 7, 2017 at 1:36 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi Nick and Jonathan,
> I had a question about your processing workflow on the Hassler. Is it standard procedure to only apply SVC once? I ask because I'm noticing that SV was not reapplied at any time after loading SBETs. In my experience, and according to CARIS, it has been standard to re-SVC any time Attitude (heave, pitch, roll) have been edited or updated as it is affecting the ray-trace.
>
> I also noticed that after applying the verified tides, that the data was not merged w/o GPS Tide. This isn't really an issue, unless there was a difference surface made to validate the VDatum model.
>
> Let me know if you have any questions about my train of thought here. It may be the empty stomach affecting my though process.
>
> Thanks for all the clarification and quick turn-arounds on my questions. Hope the survey is going well out there.
>
> Sincerely,
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406

--
Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

OPR-G309-FH-16 ERS Capability Memo

1 message

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 9:05 AM
To: _NOS OCS HSD ERS Deliverables <ers.deliverables@noaa.gov>
Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, James J Miller <james.j.miller@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Please find the attached ERS Capability Memo for project OPR-G309-FH-16 Approaches to Wilmington.

V/r
LT Morgan

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

OPR-G309-FH-16_ERS_Capability_Memo.pdf
1111K

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

NOAA Ship Hassler SV Correct

4 messages

Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov> Wed, Feb 15, 2017 at 10:11 AM
To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski,

I have reviewed the technical details associated with the situation surrounding the Hassler surveys that are currently in question. As currently understood, there are approximately 16 surveys between AHB and Hassler. The issue, as I understand it in general terms, is that the data in question was not SVP corrected after SBET computation and application to the data. Based on my technical review I would like the current remediation:

1. Pick one survey to serve as a representative example of this set. Save the current BASE surface with the SVP applied *before* SBET application as _OLD. Then, re-apply SVP and recompute a *new* grid. Do a difference surface and compute the min, max, average, and standard deviation for this difference surface.

   Based on my review the SBET process does no change the roll, pitch, or yaw nor the location of the transducer in the water column - or at least not in a meaningful way. This representative data set should confirm that.

2. Please report the finding of this analysis. Assuming it is exceedingly small, I think the next steps are:

   - Create a revised DAPR that can be used for all surveys that describes the problem and the analysis. I expect that you will work with AHB to arrange this documentation is properly included with all surveys.

   - I will provide a waiver in light of this analysis that authorizes the data to proceed using the current process.

   - Include both the waiver and this email in the separates for all theses surveys to document the action taken.

   - Ensure Hassler SOPs are updated to ensure this process is corrected.

3. If the analysis shows anything more than a 5cm difference, please advise me. We will discuss how to proceed from there.

It is my expectation that we will manage similar problems encountered with other field units or our contractors in a similar and consistent fashion. If there are any questions, concerns, or details I have not addressed I expect you or LCDR Welton will contact me with that information.

Rick

CAPT Rick Brennan, NOAA
Chief, Hydrographic Surveys Division
1315 East-West Highway, SSMC3 Room 6823
Silver Spring, MD 20910
Work: 301-713-2700
Cell: 443-994-3301

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 10:36 AM
To: James J Miller <james.j.miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

Project workflow for processing

34 messages

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Tue, Feb 7, 2017 at 1:36 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: James J Miller <James.J.Miller@noaa.gov>, Tyanne Faulkes <tyanne.faulkes@noaa.gov>

Hi Nick and Jonathan,
I had a question about your processing workflow on the Hassler. Is it standard procedure to only apply SVC once? I ask because I'm noticing that SV was not reapplied at any time after loading SBETs. In my experience, and according to CARIS, it has been standard to re-SVC any time Attitude (heave, pitch, roll) have been edited or updated as it is affecting the ray-trace.

I also noticed that after applying the verified tides, that the data was not merged w/o GPS Tide. This isn't really an issue, unless there was a difference surface made to validate the VDatum model.

Let me know if you have any questions about my train of thought here. It may be the empty stomach affecting my though process.

Thanks for all the clarification and quick turn-arounds on my questions. Hope the survey is going well out there.

Sincerely,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Tue, Feb 7, 2017 at 2:26 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: James J Miller <James.J.Miller@noaa.gov>, Tyanne Faulkes <tyanne.faulkes@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi Clint,

We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.

Anyways, James Miller is currently inquiring with Caris.

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854
[Quoted text hidden]

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Tue, Feb 7, 2017 at 2:34 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: James J Miller <James.J.Miller@noaa.gov>, Tyanne Faulkes <tyanne.faulkes@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

[Quoted text hidden]

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> Tue, Feb 7, 2017 at 2:35 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, James J Miller <James.J.Miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi all,

As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...

Tyanne
[Quoted text hidden]
--
Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Tue, Feb 7, 2017 at 4:51 PM
To: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
Cc: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, James J Miller <James.J.Miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Wed, Feb 8, 2017 at 7:00 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, James J Miller <James.J.Miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

Hey Nick,
Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 7:57 AM
To: Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov>

Hi Jeff,

Just wanted to inform you on this....

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

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OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 7:59 AM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, James J Miller <James.J.Miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov> Wed, Feb 8, 2017 at 8:35 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>

Ugh...

I would imagine there could be small differences between the ray tracing process, but also would have thought it just re-considered the SVP data that was already loaded when re-merging after the SBET and GPS Tides had been applied.

Let me know if there is anything I can do to help.

Jeff
[Quoted text hidden]
--
Jeff Marshall
Certified Hydrographer/Physical Scientist
NOAA's Office of Coast Survey
Atlantic Hydrographic Branch
439 West York St.
Norfolk, VA 23435
Office Phone: 757-441-6746 ext. 109
Telework Phone: 908-601-2940
Email: jeffery.marshall@noaa.gov

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 8:41 AM
To: Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov>

We are still trying to determine a course of action. We may end up re-applying SV to all the Wilmington data since we haven't submitted it yet (but we were so close! was just doing checksums).

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 8:54 AM
To: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>
Cc: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, James J Miller <James.J.Miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>

Hi Starla,

I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.

Let us know if you or HSD has any thoughts or recommendations on this.

Thanks,
-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

[Quoted text hidden]

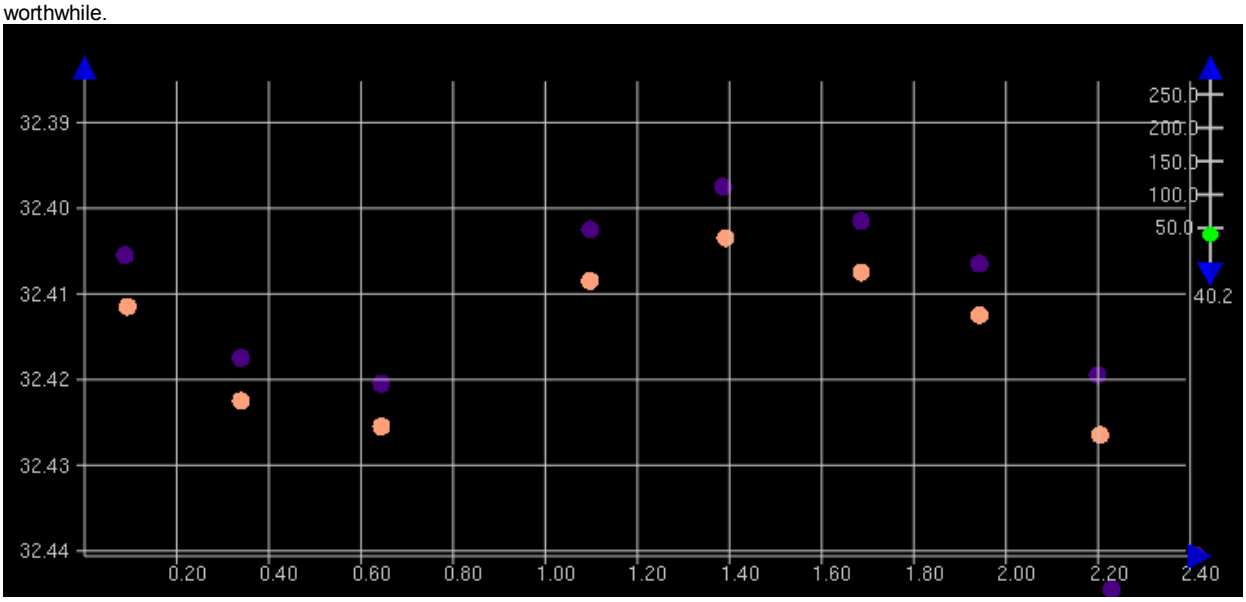
James J. Miller <james.j.miller@noaa.gov> Wed, Feb 8, 2017 at 6:11 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>

Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi everyone,

Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.

To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.



Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111
[Quoted text hidden]

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Wed, Feb 8, 2017 at 6:32 PM
To: "James J. Miller" <james.j.miller@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

[Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 8:00 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "James J. Miller" <james.j.miller@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Clint,
Thanks for for the extra analysis. The 52 cm around the wreck is alarming to me at first notice compared to the rest. Do you know what quality the soundings were that had that large difference? Are we talking extreme outer beams? Are there other soundings that may be more reliable on the shoalest portion of the feature that agree better? If not we may have to go ahead and reprocess our Wilmington surveys to be sure. At the very least reexamine our features in Wilmington.

Fun first SAR eh?

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi everyone,
>
> Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
>
> To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
> <2017-02-08_17-14-54.png>
> [Quoted text hidden]
>
> Thanks,
> James
> [Quoted text hidden]

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 8, 2017 at 8:26 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "James J. Miller" <james.j.miller@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal

<castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi James, et. al.
>
> I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.
>
> Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.
>
> Thanks,
> Clint
>
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406
>
> On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:
>> Hi everyone,
>>
>> Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
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>> <2017-02-08_17-14-54.png>
>> [Quoted text hidden]
>>
>> Thanks,
>> James
>> [Quoted text hidden]

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Thu, Feb 9, 2017 at 7:42 AM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
Cc: "James J. Miller" <james.j.miller@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi Nick,
With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

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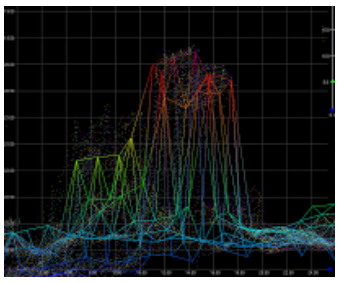

H12843 Validation subset 2D.png
156K

James J. Miller <james.j.miller@noaa.gov> Thu, Feb 9, 2017 at 9:12 AM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi Clint,

Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.

Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.

I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

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Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> Thu, Feb 9, 2017 at 12:23 PM
To: "James J. Miller" <james.j.miller@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi all,

After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).

I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.

Looking at the data in subset, there was little to no difference between the two projects.

After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!

You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.

Hope this all helped.

Cheers,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

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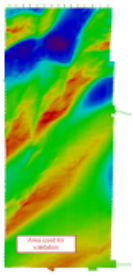
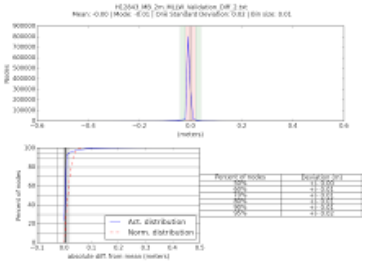
3 attachments

H12843 Validation Difference Surface.png
51K



H12843 Validation Grid View.png
170K

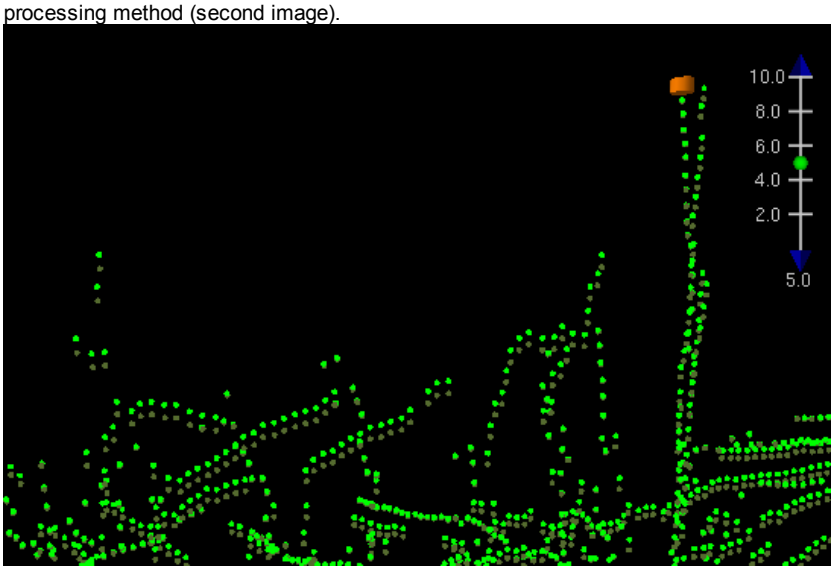


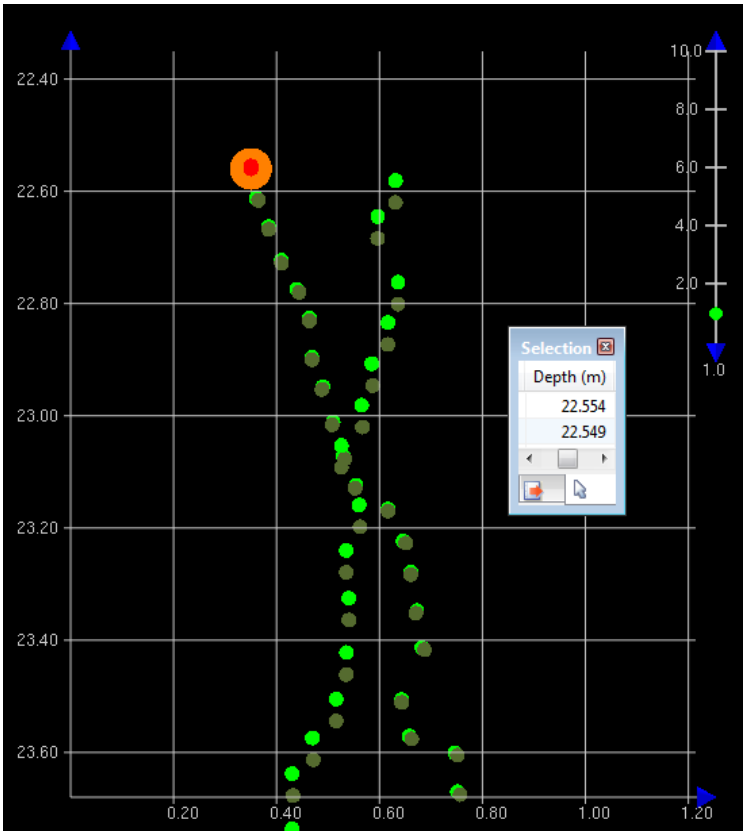
H12843_MB_2m_MLLW_Validation_Diff_2.png
126K

James J. Miller <james.j.miller@noaa.gov> Thu, Feb 9, 2017 at 12:35 PM
To: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>
Cc: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

[Quoted text hidden]

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Mon, Feb 13, 2017 at 5:46 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>
Cc: Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, "James J. Miller" <james.j.miller@noaa.gov>

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

Sincerely,
Starla

[Quoted text hidden]

--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125

Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> Mon, Feb 13, 2017 at 5:52 PM
To: CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, "James J. Miller" <james.j.miller@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).

Tyanne
[Quoted text hidden]

James J. Miller <james.j.miller@noaa.gov> Mon, Feb 13, 2017 at 6:34 PM
To: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?

The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

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To: "James J. Miller" <james.j.miller@noaa.gov>, "russell.quintero" <russell.quintero@noaa.gov>, Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>
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Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.

Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.

Sincerely,
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How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

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On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:
HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

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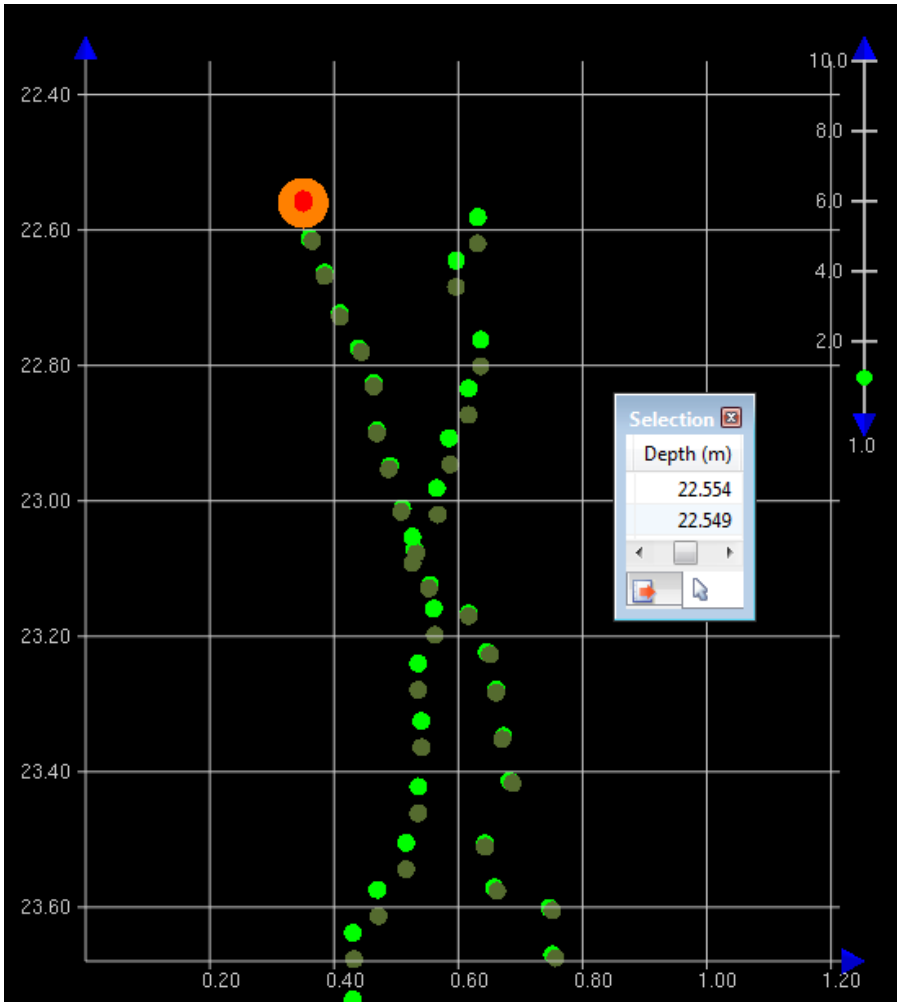
On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:
Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).



Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
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On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi all,
>
> After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).
>
> I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.
>
> Looking at the data in subset, there was little to no difference between the two projects.
>
> After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!
>
> You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.
>
> Hope this all helped.
>
> Cheers,
> Clint Marcus
> Physical Scientist

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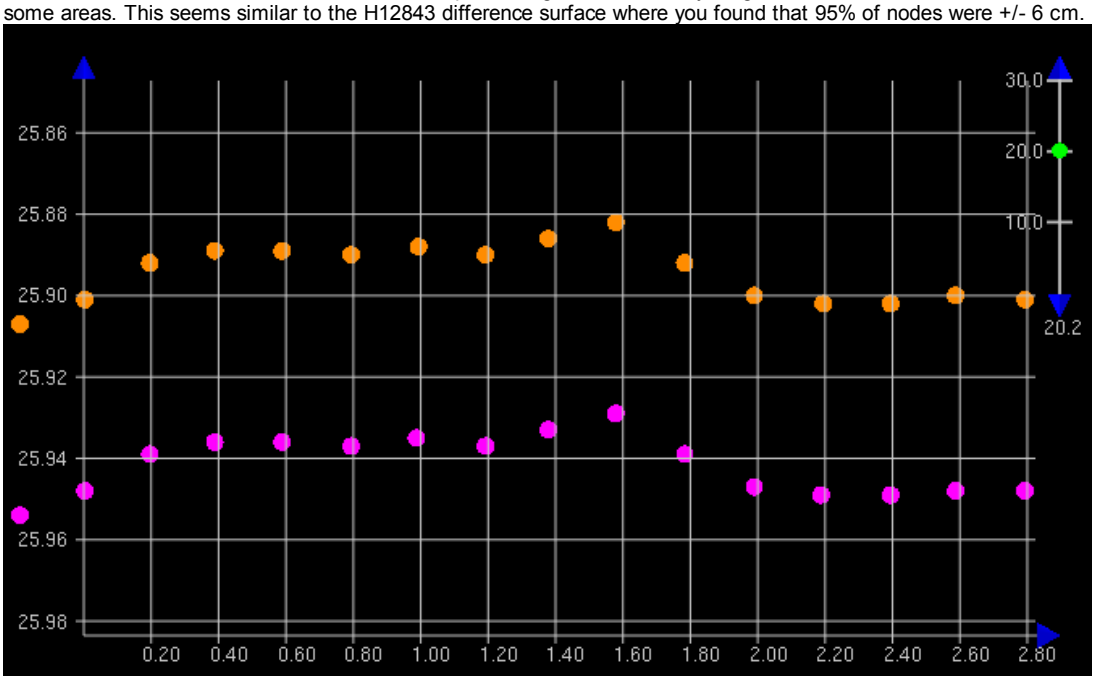
Cell: (541) 264-6406

On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi Clint,
>
> Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.
>
> Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.



> I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
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>
> On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
>
> > Hi Nick,
> > With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.
> >
> > Cheers,
> >
> > Clint Marcus
> > Physical Scientist
> > NOAA Office of Coast Survey
> > Atlantic Hydrographic Branch
> > Phone: (757) 441-6746 ext 208
> > Cell: (541) 264-6406
> >
> > On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> >
> > > Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.
> > >
> > > Nick
> > >
> > > On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

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On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi everyone,
>
> Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
>
> To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
> <2017-02-08_17-14-54.png>
>
> Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?
>
> Thanks,
> James
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
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> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111
>
> On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Hi Starla,
> >
> > I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
> >
> > Let us know if you or HSD has any thoughts or recommendations on this.
> >
> > Thanks,
> > -Nick
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hey Nick,
Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
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On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.

-Nick

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29 Wentworth Road
New Castle, NH, 03854

On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

Hi all,

As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...

Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
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On Tue, Feb 7, 2017 at 2:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Hi Clint,

We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.

Anyways, James Miller is currently inquiring with Caris.

-Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road

New Castle, NH, 03854

On Tue, Feb 7, 2017 at 1:36 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi Nick and Jonathan,
> I had a question about your processing workflow on the Hassler. Is it standard procedure to only apply SVC once? I ask because I'm noticing that SV was not reapplied at any time after loading SBETs. In my experience, and according to CARIS, it has been standard to re-SVC any time Attitude (heave, pitch, roll) have been edited or updated as it is affecting the ray-trace.
>
> I also noticed that after applying the verified tides, that the data was not merged w/o GPS Tide. This isn't really an issue, unless there was a difference surface made to validate the VDatum model.
>
> Let me know if you have any questions about my train of thought here. It may be the empty stomach affecting my though process.
>
> Thanks for all the clarification and quick turn-arounds on my questions. Hope the survey is going well out there.
>
> Sincerely,
> Clint Marcus
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Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
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Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

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I agree with Tyanne. The magnitude of the error is well within the sound speed error budget of 0.30m plus 0.5% of depth (2016 HSSD Section 5.2.3.5). All surveys contain errors and blunders. What matters is whether the error exceeds the specs.

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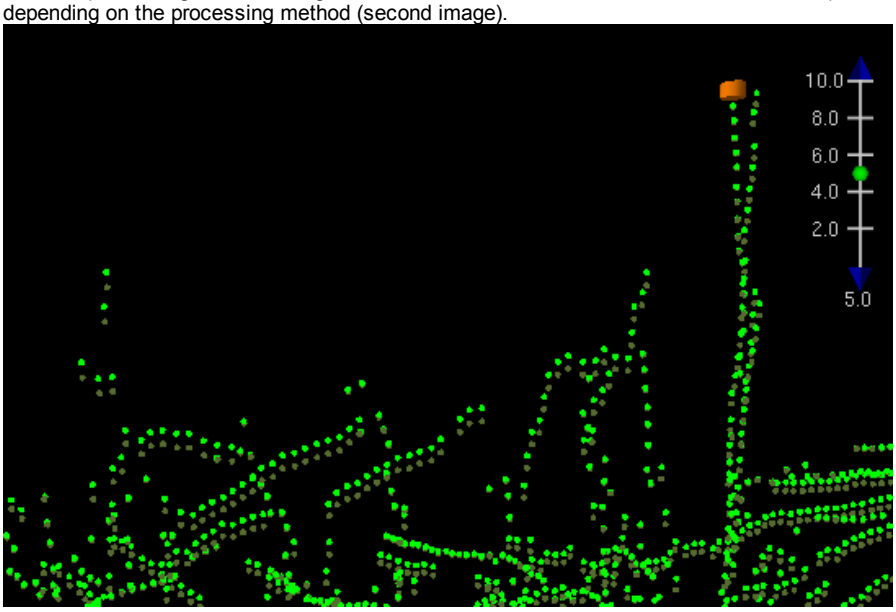

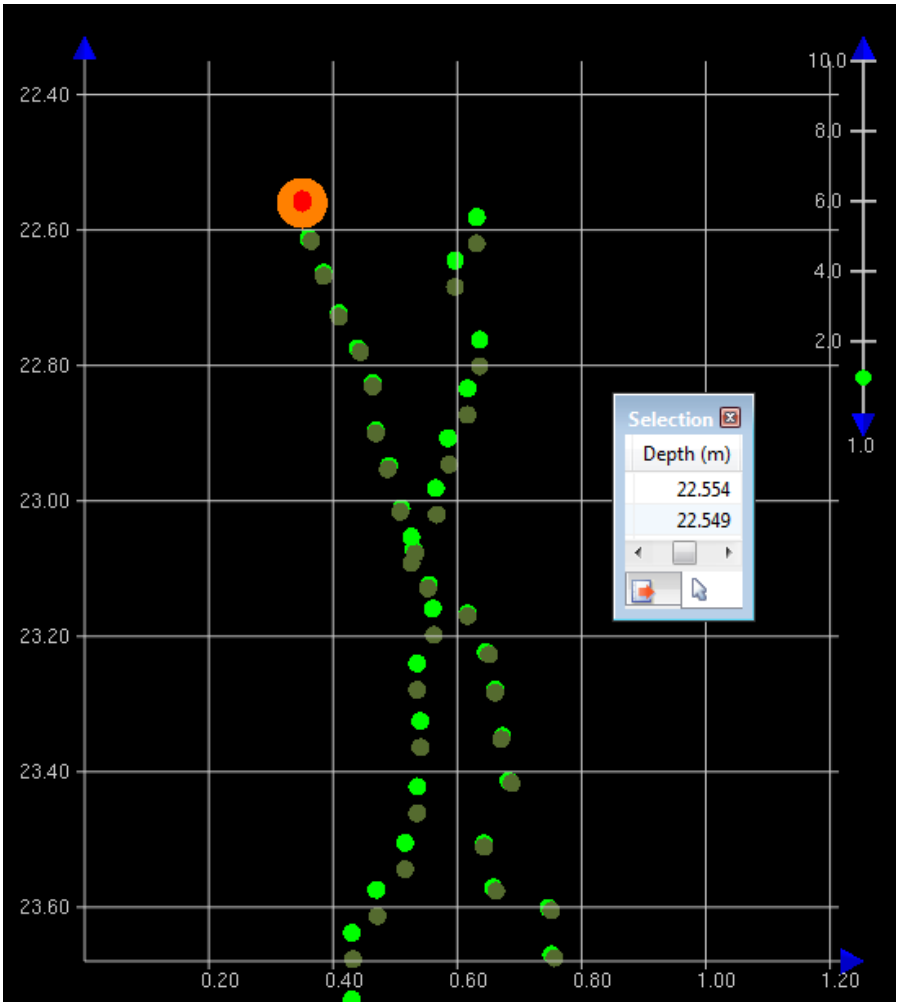

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Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi all,

After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).

I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.

Looking at the data in subset, there was little to no difference between the two projects.

After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!

You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.

Hope this all helped.

Cheers,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

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Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.

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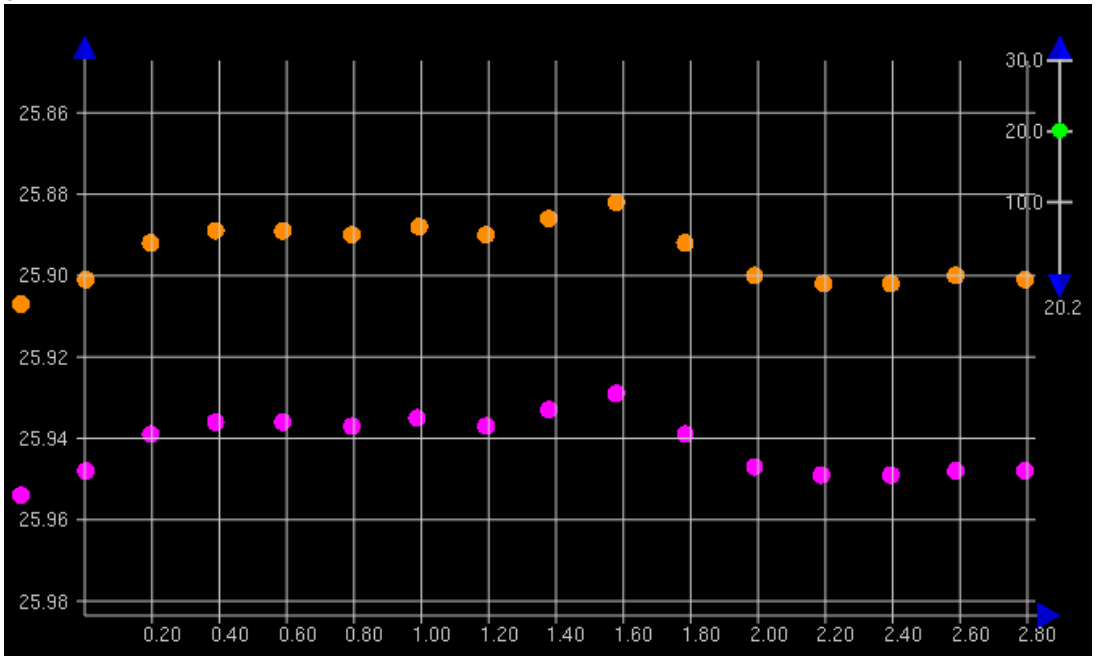

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Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

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> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Hey Nick,
> > > Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.
> > >
> > > Cheers,
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> > > Clint Marcus
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> > > On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> > >
> > > > So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
> > > >
> > > > -Nick
> > > >
> > > > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > > > 29 Wentworth Road
> > > > New Castle, NH, 03854
> > > >
> > > > On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

Hi all,

As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...

Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.
>
> Cheers,
>
> Clint Marcus
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> On Tue, Feb 7, 2017 at 2:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Hi Clint,
> >
> > We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.
> >
> > Anyways, James Miller is currently inquiring with Caris.
> >
> > -Nick
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Tue, Feb 7, 2017 at 1:36 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Hi Nick and Jonathan,
> > > I had a question about your processing workflow on the Hassler. Is it standard procedure to only apply SVC once? I ask because I'm noticing that SV was not reapplied at any time after loading SBETs. In my experience, and according to CARIS, it has been standard to re-SVC any time Attitude (heave, pitch, roll) have been edited or updated as it is affecting the ray-trace.
> > >
> > > I also noticed that after applying the verified tides, that the data was not merged w/o GPS Tide. This isn't really an issue, unless there was a difference surface made to validate the VDatum model.
> > >
> > > Let me know if you have any questions about my train of thought here. It may be the empty stomach affecting my though process.
> > >
> > > Thanks for all the clarification and quick turn-arounds on my questions. Hope the survey is going well out there.
> > >
> > > Sincerely,
> > > Clint Marcus
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--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
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Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> Mon, Feb 13, 2017 at 7:54 PM
To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "James J. Miller" <james.j.miller@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.

That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.

We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.

This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.

We stand by ready to concur with a request to waive redoing the analysis if the reprocessed data is barely different. We have no desire to be punitive here, and we have every reason to strive to make both the field and office as efficient as possible. We are extremely sympathetic and Starla and I both worked on the wording of the bad news email to ensure it didn't come across as negative in any way; but that doesn't change that the right answer is to make it right.

Very Respectively,

Russell

On Mon, Feb 13, 2017 at 19:30 Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

On Mon, Feb 13, 2017 at 4:17 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.

Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.

Sincerely,
Starla

On Mon, Feb 13, 2017 at 6:34 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?

The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?

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On Mon, Feb 13, 2017 at 5:52 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).

Tyanne

On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

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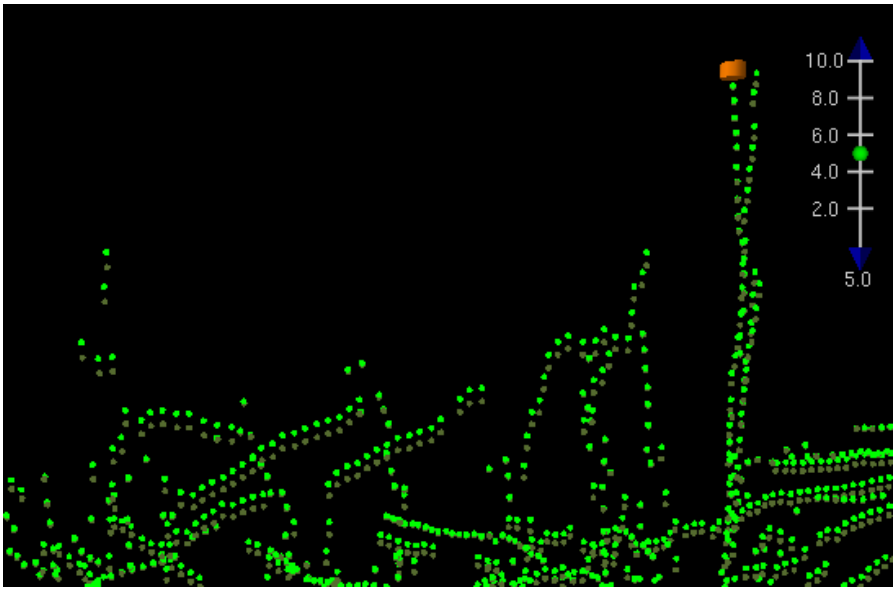
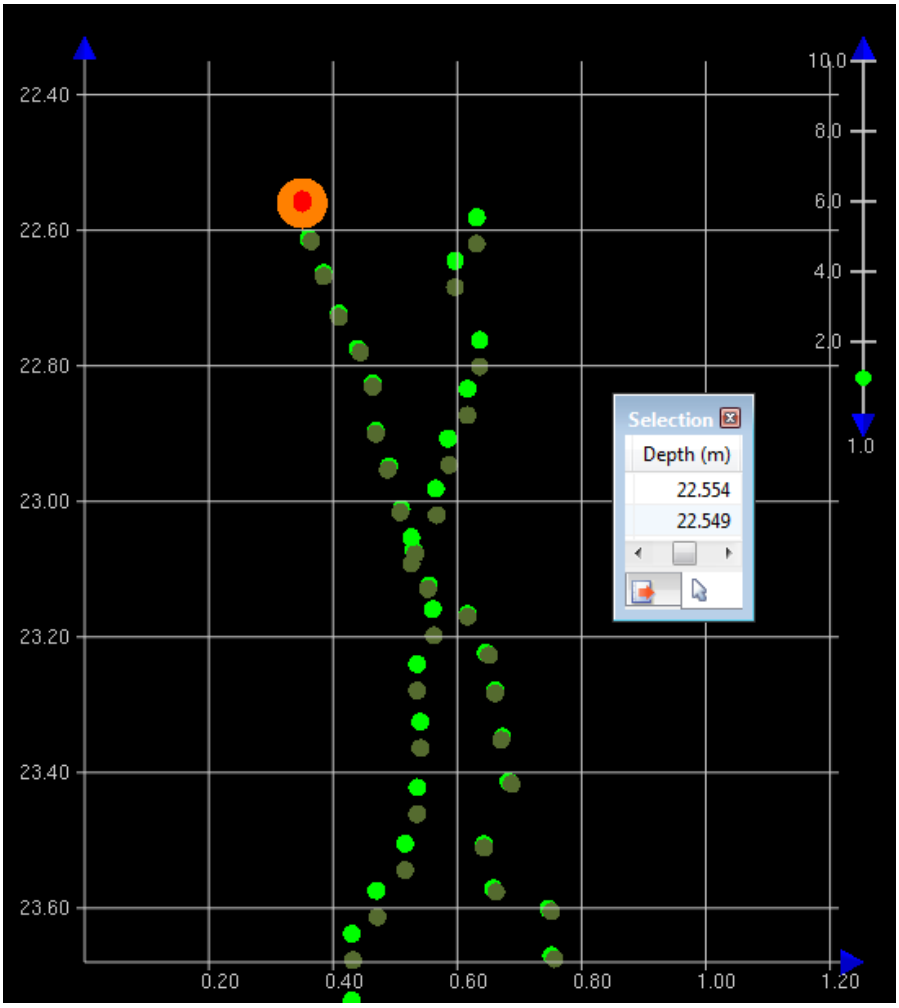
On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

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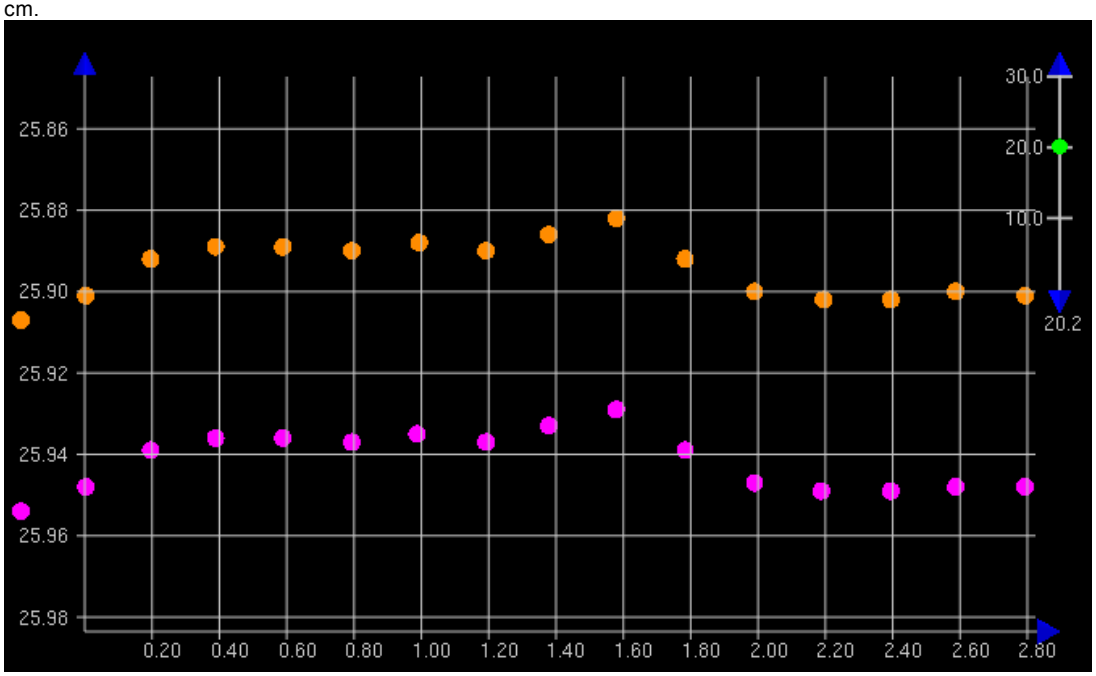

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> > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Hey Nick,
> > > Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.
> > >
> > > Cheers,
> > >
> > > Clint Marcus
> > > Physical Scientist
> > > NOAA Office of Coast Survey
> > > Atlantic Hydrographic Branch
> > > Phone: (757) 441-6746 ext 208
> > > Cell: (541) 264-6406
> > >
> > > On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
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> > > >
> > > > -Nick
> > > >
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> > > > 29 Wentworth Road
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> > > >
> > > > On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:
> > > >
> > > > > Hi all,
> > > > >
> > > > > As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
> > > > >
> > > > > Tyanne
> > > > >
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> > > > >
> > > > > > Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
Physical Scientist
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> We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.
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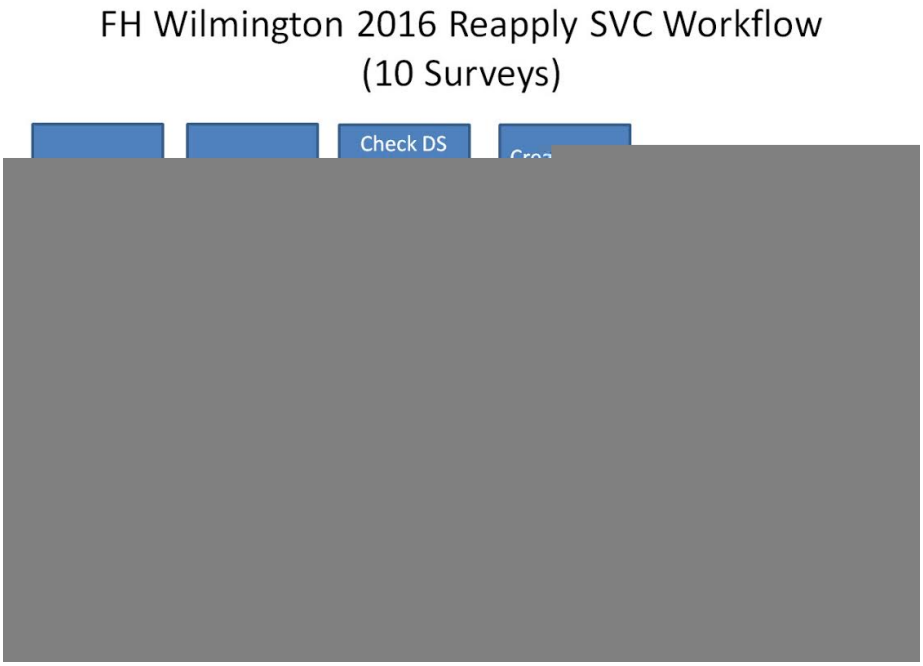
--
Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch

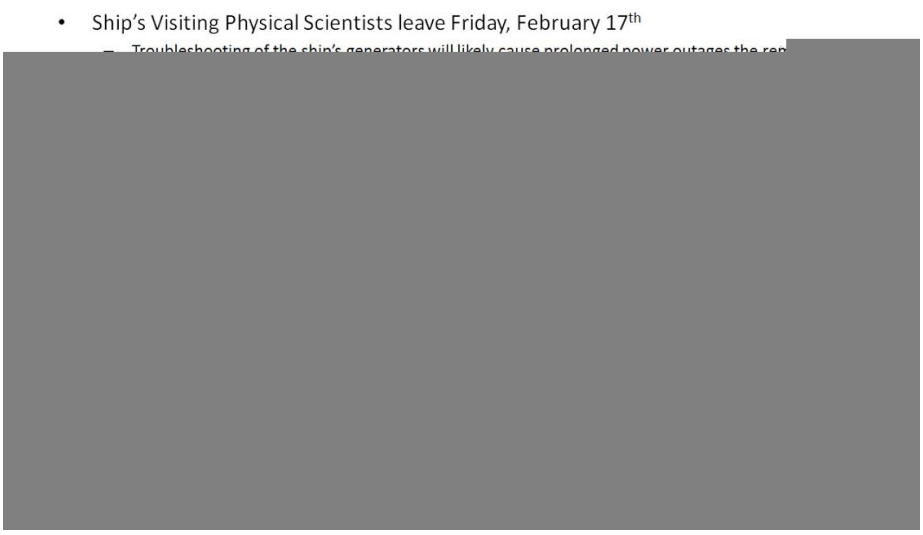
--
Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Mon, Feb 13, 2017 at 8:38 PM
To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>
Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "James J. Miller" <james.j.miller@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Just a rough outline of the work that needs to be done. See slide two for additional factors that will affect processing times....

V/r
Nick





Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Mon, Feb 13, 2017 at 7:54 PM, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.

That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.

We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.

This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.

We stand by ready to concur with a request to waive redoing the analysis if the reprocessed data is barely different. We have no desire to be punitive here, and we have every reason to strive to make both the field and office as efficient as possible. We are extremely sympathetic and Starla and I both worked on the wording of the bad news email to ensure it didn't come across as negative in any way; but that doesn't change that the right answer is to make it right.

Very Respectively,
Russell

On Mon, Feb 13, 2017 at 19:30 Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

On Mon, Feb 13, 2017 at 4:17 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.

Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.

Sincerely,
Starla

On Mon, Feb 13, 2017 at 6:34 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?

The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Mon, Feb 13, 2017 at 5:52 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).

Tyanne

On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

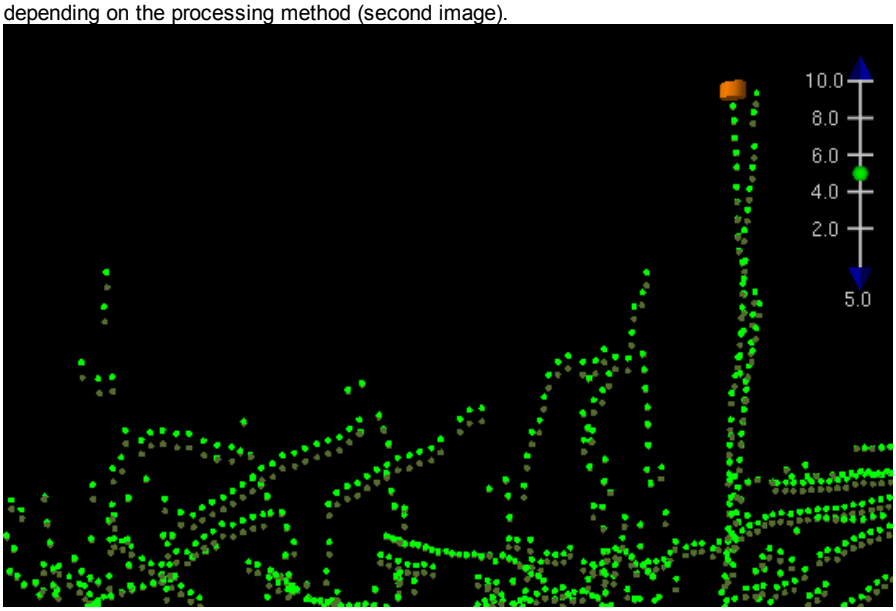
To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

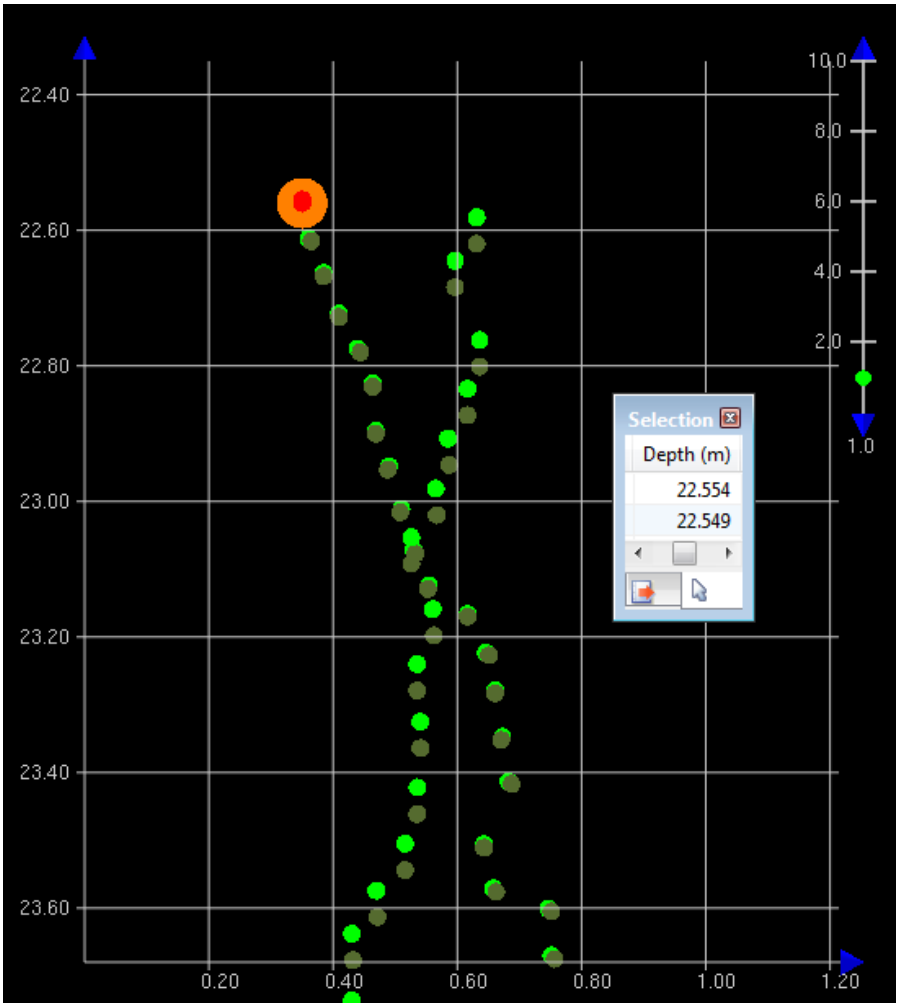
Sincerely,
Starla

On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





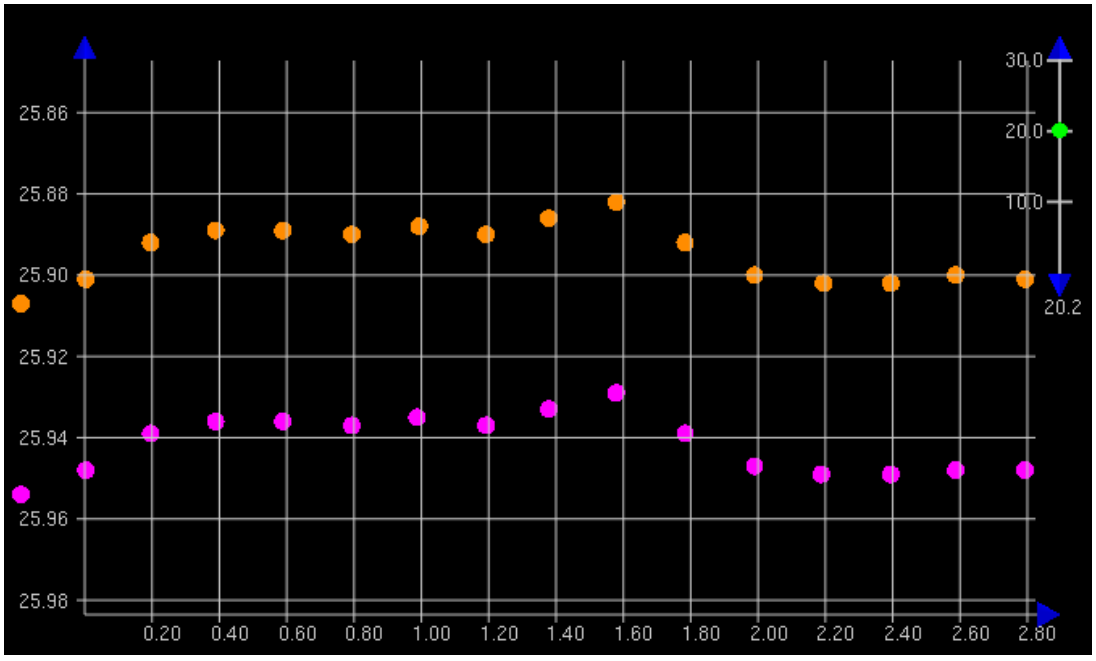
Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi all,
>
> After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).
>
> I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.
>
> Looking at the data in subset, there was little to no difference between the two projects.
>
> After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!
>
> You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.
>
> Hope this all helped.
>
> Cheers,
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406
>
> On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:
>
> > Hi Clint,
> >
> > Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.
> >
> > Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.
> >
> > 
> >

I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.

James J. Miller
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NOAA Office of Coast Survey
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439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi Nick,
> With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.
>
> Cheers,
>
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> Physical Scientist
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>
> On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.
> >
> > Nick
> >
> > On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > Hi James, et. al.
> >
> > I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.
> >
> > Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.
> >
> > Thanks,
> > Clint
> >
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> >
> > On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:
> >
> > > Hi everyone,
> > >
> > > Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
> > >
> > > To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
> > > <2017-02-08_17-14-54.png>
> > >
> > > Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

Thanks,
James

James J. Miller
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NOAA Office of Coast Survey
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On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Hi Starla,
>
> I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
>
> Let us know if you or HSD has any thoughts or recommendations on this.
>
> Thanks,
> -Nick
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Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch

--
Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

FH Wilmington 2016 Reapply SVC Workflow.pptx
71K

Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov> Mon, Feb 13, 2017 at 8:41 PM
To: John Doroba <John.Doroba@noaa.gov>, "eric.g.younkin@noaa.gov (Google Drive)" <eric.g.younkin@noaa.gov>
Cc: Samuel Greenaway - NOAA Federal <samuel.greenaway@noaa.gov>
Bcc: ops.ferdinand.hassler@noaa.gov

Eric, John,

I've been staying out of this thread, waiting to see how HSD OPS would ultimately rule. Unfortunately, looks like FH will need to reprocess all of OPR-G309-FH-16.

Do you have any thoughts on how HSTB might help reduce the effort required (esp. where active time is concerned) to reprocess an entire project? Are there any creative solutions here?
Maybe, say, processing on a blade server using a modified version of your benchmarking script? Bonus if we can automate a cursory QC of the resulting surfaces (e.g., surface differencing)?

Thanks,
Janice

---------- Forwarded message ---------
From: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>
Date: Mon, Feb 13, 2017 at 7:54 PM
Subject: Re: Project workflow for processing
To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, James J. Miller <james.j.miller@noaa.gov>, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.

That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.

We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.

This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.

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Very Respectively,
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James J. Miller
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439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

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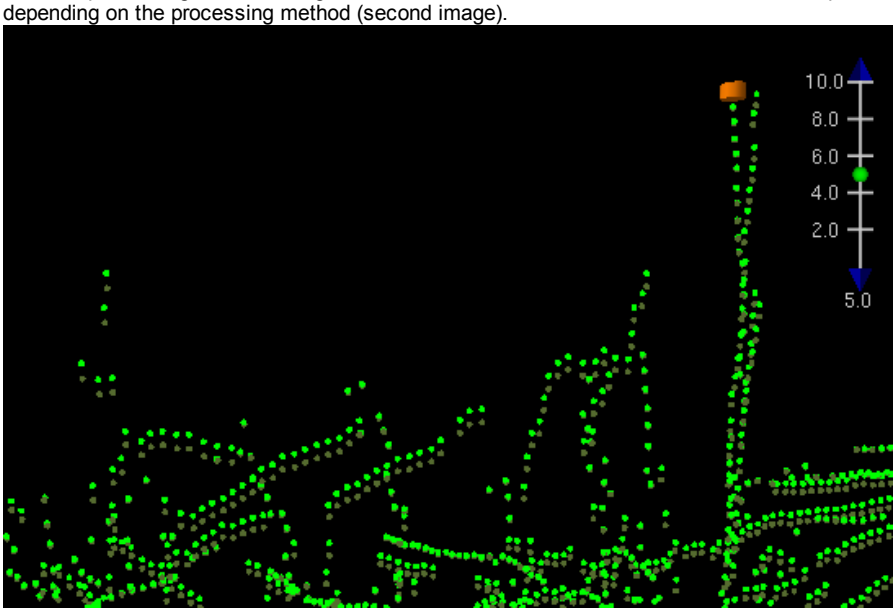

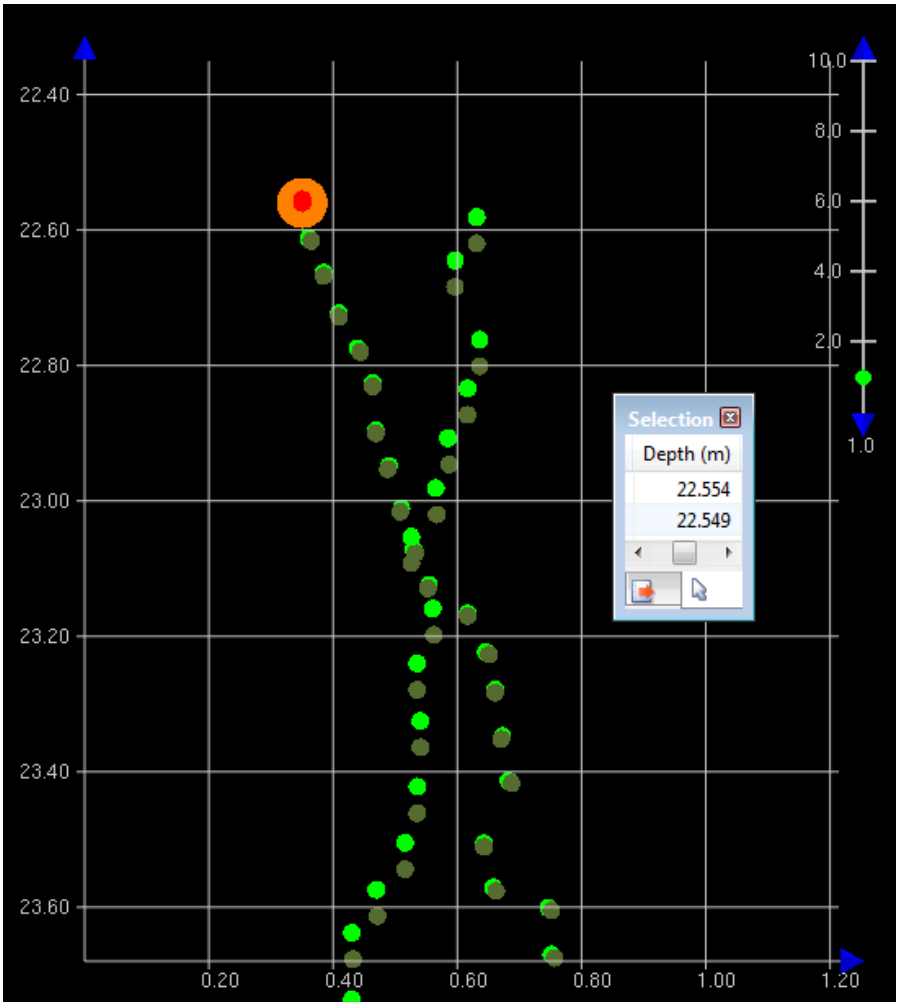

Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

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>
> Hope this all helped.
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> Cheers,
> Clint Marcus
> Physical Scientist

NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

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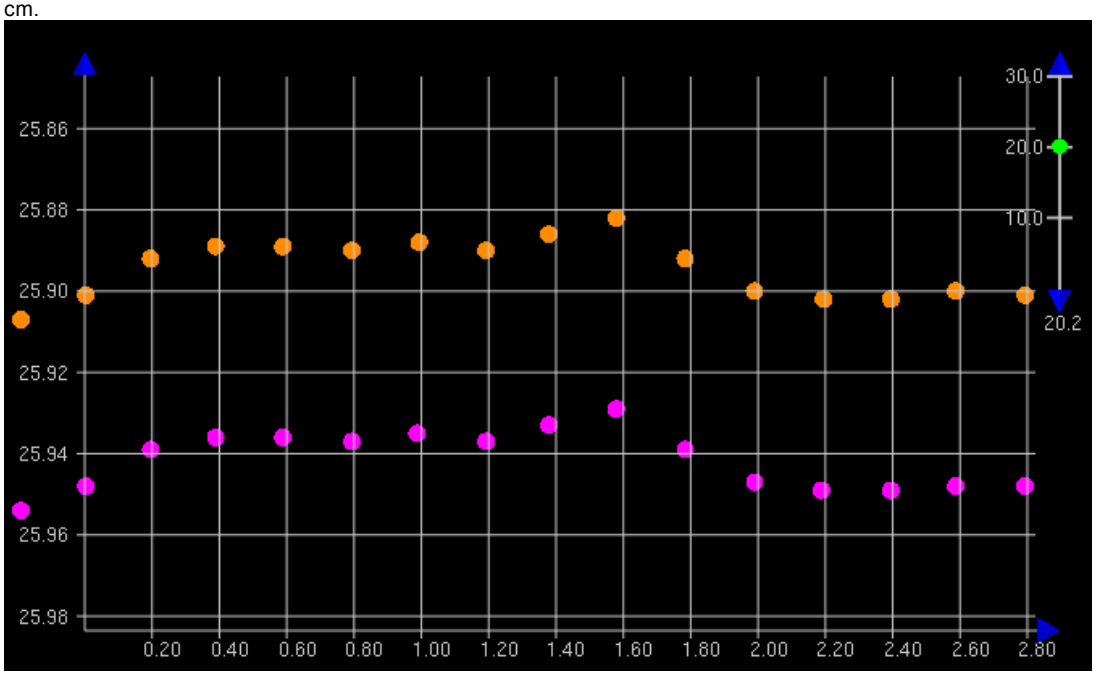
>
> Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.



> I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111
>
> On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
>
> > Hi Nick,
> > With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.
> >
> > Cheers,
> >
> > Clint Marcus
> > Physical Scientist
> > NOAA Office of Coast Survey
> > Atlantic Hydrographic Branch
> > Phone: (757) 441-6746 ext 208
> > Cell: (541) 264-6406
> >
> > On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> >
> > > Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.
> > >
> > > Nick
> > >
> > > On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
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On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi everyone,
>
> Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
>
> To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
> <2017-02-08_17-14-54.png>
>
> Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?
>
> Thanks,
> James
>
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> Physical Scientist
> NOAA Office of Coast Survey
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> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111
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> On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Hi Starla,
> >
> > I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
> >
> > Let us know if you or HSD has any thoughts or recommendations on this.
> >
> > Thanks,
> > -Nick
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854

On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hey Nick,
Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.

-Nick

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29 Wentworth Road
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On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

Hi all,

As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...

Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
Physical Scientist
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On Tue, Feb 7, 20

--
Janice Eisenberg
Physical Scientist
Hydrographic Systems and Technology Branch
NOAA Office of Coast Survey
301-713-2653 X144
Janice.Eisenberg@noaa.gov

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Mon, Feb 13, 2017 at 9:22 PM
To: "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Briana Welton - NOAA Federal <briana.welton@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, Erin Weller - NOAA Federal <erin.weller@noaa.gov>, Robert Short - NOAA Federal

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Bobby Short and Doug Wood will be able to help next leg. Would this be an opportunity to use remote support?

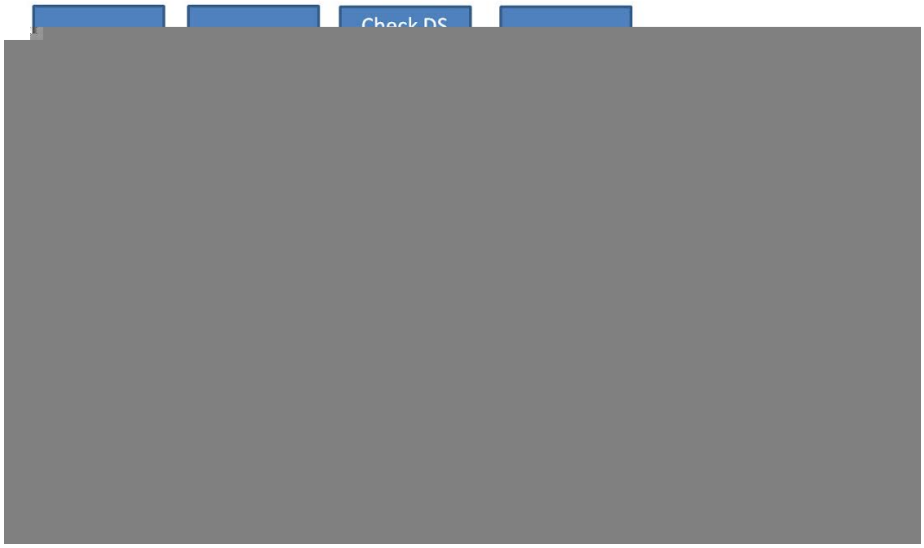
Janice, How many instances of CARIS can you process on simultaneously?

On Mon, Feb 13, 2017 at 8:38 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Just a rough outline of the work that needs to be done. See slide two for additional factors that will affect processing times....

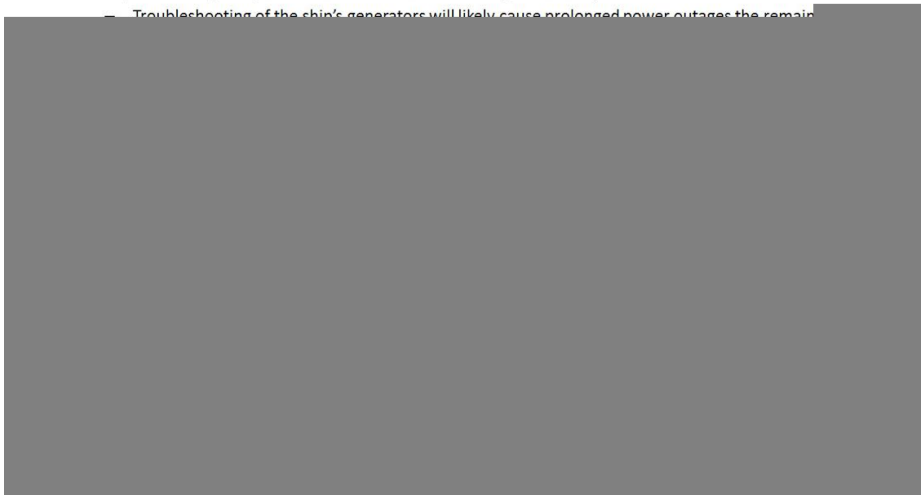
V/r
Nick

FH Wilmington 2016 Reapply SVC Workflow (10 Surveys)



Additional Factors

- Ship's Visiting Physical Scientists leave Friday, February 17th
  - Troubleshooting of the ship's generators will likely cause prolonged power outages the remain



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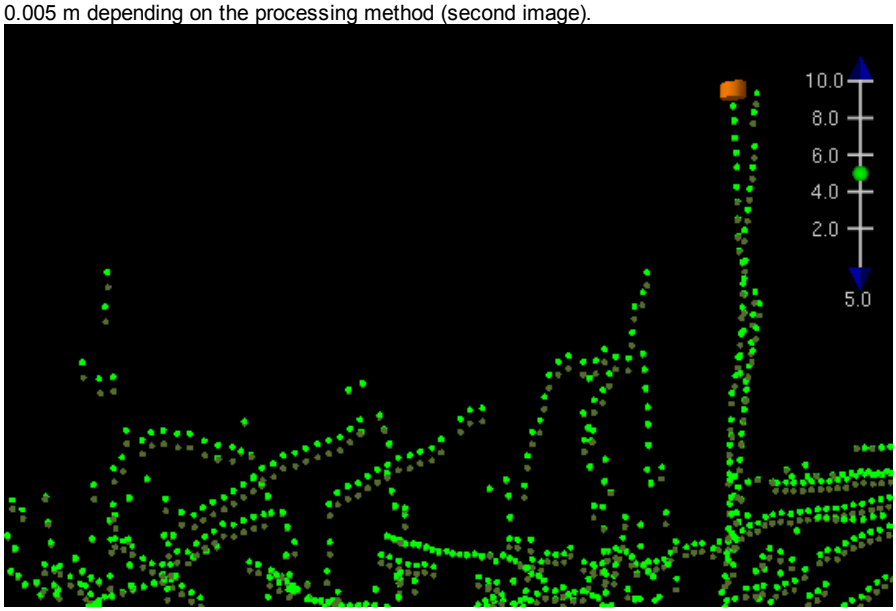

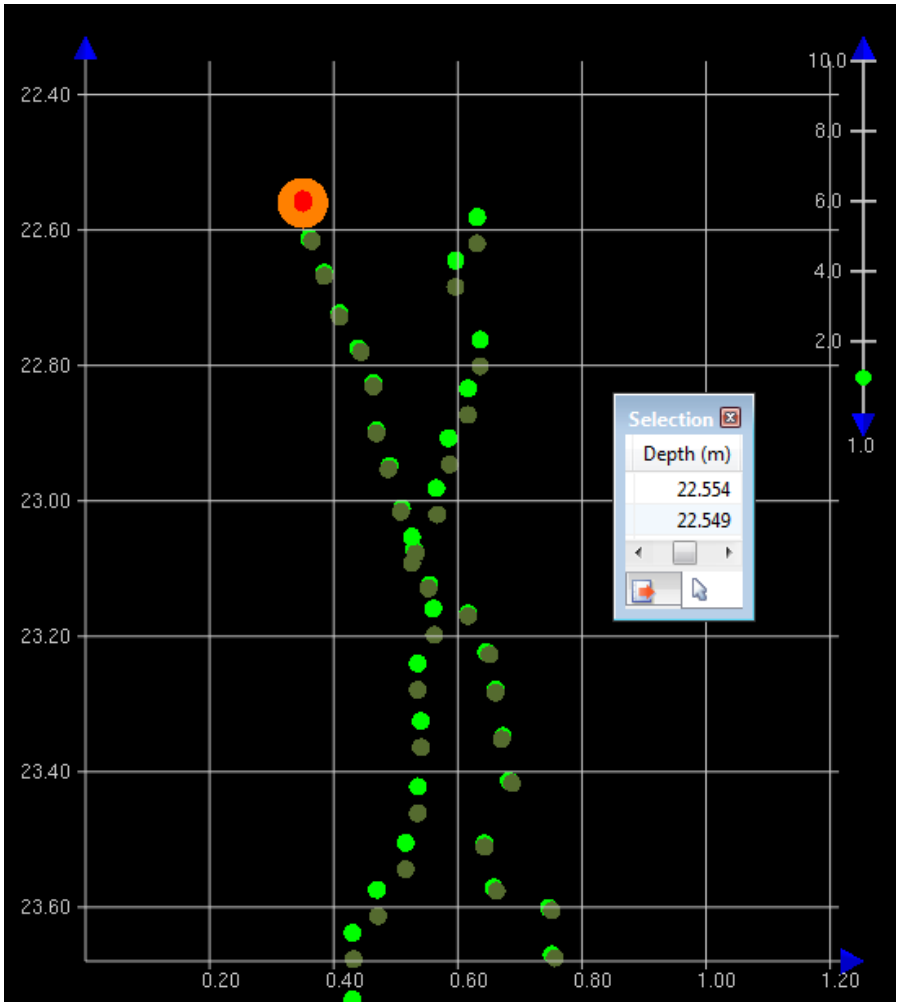

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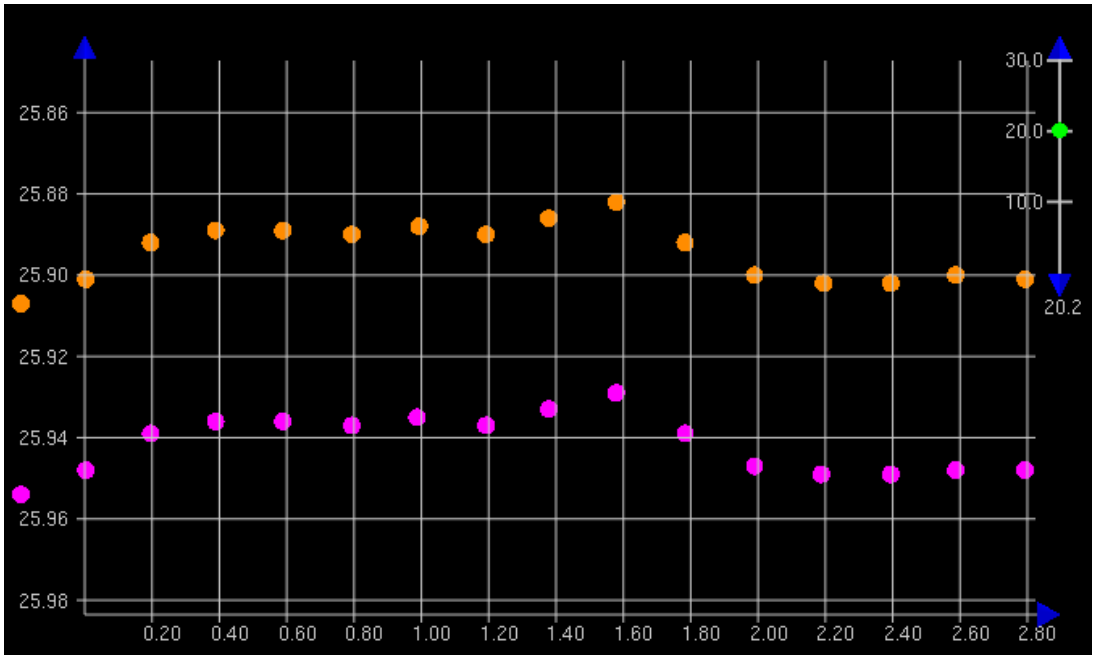

I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

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> Hi Nick,
> With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.
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> Cheers,
>
> Clint Marcus
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> NOAA Office of Coast Survey
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> Phone: (757) 441-6746 ext 208
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> >
> > Thanks,
> > Clint

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Physical Scientist
NOAA Office of Coast Survey
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> Hi everyone,
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> Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
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> James
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111
>
> On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Hi Starla,
> >
> > I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
> >
> > Let us know if you or HSD has any thoughts or recommendations on this.
> >
> > Thanks,
> > -Nick
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> >
> > > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> > >
> > > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > > 29 Wentworth Road
> > > New Castle, NH, 03854
> > >
> > > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> > >
> > > > Hey Nick,
> > > > Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is

doing out there for you. Thanks again for looking into that.

Cheers,

Clint Marcus
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On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
>
> -Nick
>
> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:
>
> > Hi all,
> >
> > As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
> >
> > Tyanne
> >
> > On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.
> > >
> > > Cheers,
> > >
> > > Clint Marcus
> > > Physical Scientist
> > > NOAA Office of Coast Survey
> > > Atlantic Hydrographic Branch
> > > Phone: (757) 441-6746 ext 208
> > > Cell: (541) 264-6406
> > >
> > > On Tue, Feb 7, 2017 at 2:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> > >
> > > > Hi Clint,
> > > >
> > > > We are going to check into it with Caris to see exactly how it affects things. Pat Berube did all the processing on this survey and since he was of the FA processing mold, I have to believe that he might have cut that step out for a reason (I HOPE). We are going to contact Caris and find out so standby. LTJG Debroisse is aboard and seems to remember hearing that Caris mentioned that it's not necessary but the FA still went though the step anyhow.
> > > >
> > > > Anyways, James Miller is currently inquiring with Caris.
> > > >
> > > > -Nick
> > > >
> > > > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > > > 29 Wentworth Road
> > > > New Castle, NH, 03854
> > > >
> > > > On Tue, Feb 7, 2017 at 1:36 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> > > >
> > > > > Hi Nick and Jonathan,
> > > > > I had a question about your processing workflow on the Hassler. Is it standard procedure to only apply SVC once? I ask because I'm noticing that SV was not reapplied at any time after loading SBETs. In my experience, and according to CARIS, it has been standard to re-SVC any time Attitude (heave, pitch, roll) have been edited or updated as it is affecting the ray-trace.

I also noticed that after applying the verified tides, that the data was not merged w/o GPS Tide. This isn't really an issue, unless there was a difference surface made to validate the VDatum model.

Let me know if you have any questions about my train of thought here. It may be the empty stomach affecting my though process.

Thanks for all the clarification and quick turn-arounds on my questions. Hope the survey is going well out there.

Sincerely,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

--
Tyanne Faulkes
Physical Scientist
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch

--
Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
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--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov> Mon, Feb 13, 2017 at 9:35 PM
To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>, Erin Weller - NOAA Federal <erin.weller@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Robert Short - NOAA Federal <robert.short@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>
Cc: CO HASSLER <co.ferdinand.hassler@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, "James J. Miller" <james.j.miller@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>

Starla,

With the volume of data we are talking about here, I would recommend that we carefully consider processing configurations, including some more creative solutions which may be available. I am currently discussing with HSTB.

We should bear in mind that any bottlenecks in our existing processing capabilities -- whether on the ship or shoreside -- are likely to be exacerbated by the volume of data we will be ramming through the pipeline.

I'll be in touch tomorrow.

Thanks,
Janice

On Mon, Feb 13, 2017 at 9:22 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

> Bobby Short and Doug Wood will be able to help next leg. Would this be an opportunity to use remote support?
>
> Janice, How many instances of CARIS can you process on simultaneously?
>
> On Mon, Feb 13, 2017 at 8:38 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Just a rough outline of the work that needs to be done. See slide two for additional factors that will affect processing times....

V/r
Nick

FH Wilmington 2016 Reapply SVC Workflow

Additional Factors

- Ship's Visiting Physical Scientists leave Friday, February 17th

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Mon, Feb 13, 2017 at 7:54 PM, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.

That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.

We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.

This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.

We stand by ready to concur with a request to waive redoing the analysis if the reprocessed data is barely different. We have no desire to be punitive here, and we have every reason to strive to make both the field and office as efficient as possible. We are extremely sympathetic and Starla and I both worked on the wording of the bad news email to ensure it didn't come across as negative in any way; but that doesn't change that the right answer is to make it right.

Very Respectively,
Russell

On Mon, Feb 13, 2017 at 19:30 Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

On Mon, Feb 13, 2017 at 4:17 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.

Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.

Sincerely,
Starla

On Mon, Feb 13, 2017 at 6:34 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?

The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Mon, Feb 13, 2017 at 5:52 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).

Tyanne

On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

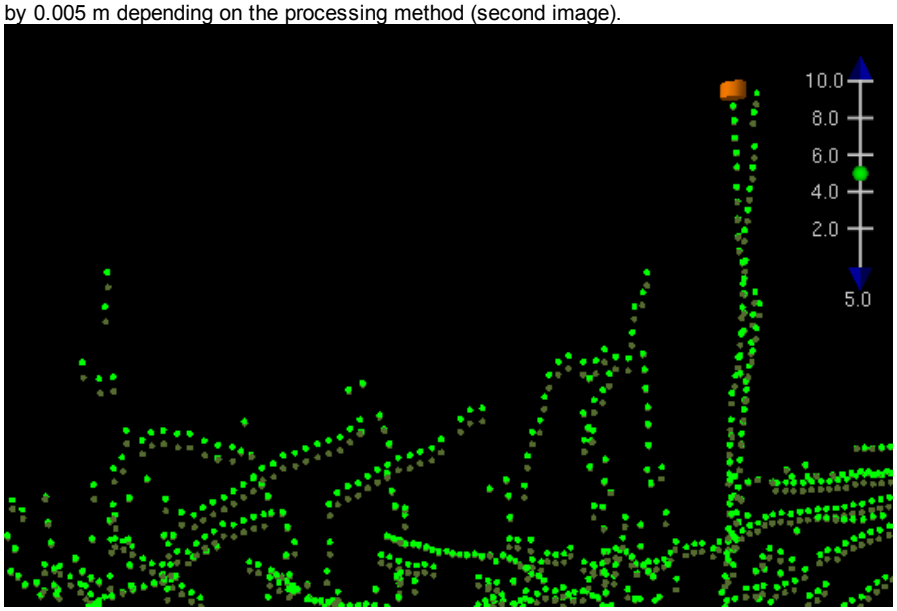
Sincerely,

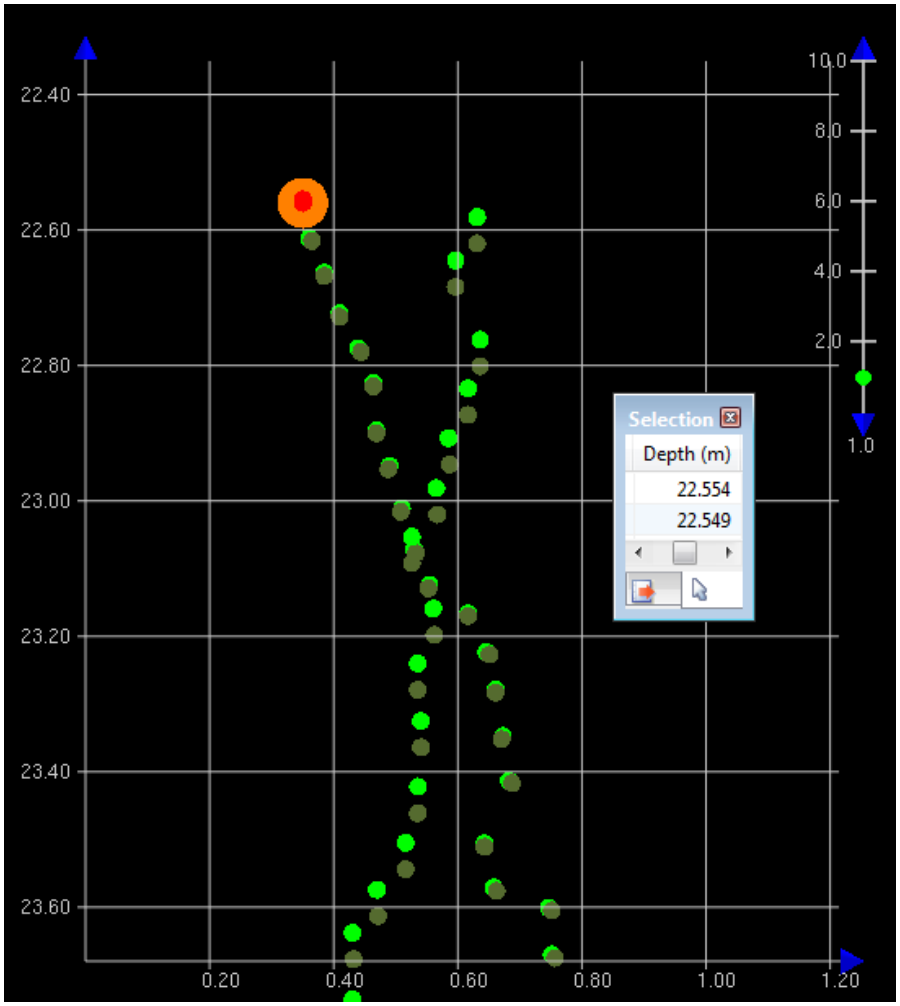
Starla

On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing

method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
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On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi all,
>
> After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).
>
> I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.
>
> Looking at the data in subset, there was little to no difference between the two projects.
>
> After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!
>
> You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.
>
> Hope this all helped.
>
> Cheers,
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406
>
> On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:
>
> > Hi Clint,
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> > Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.
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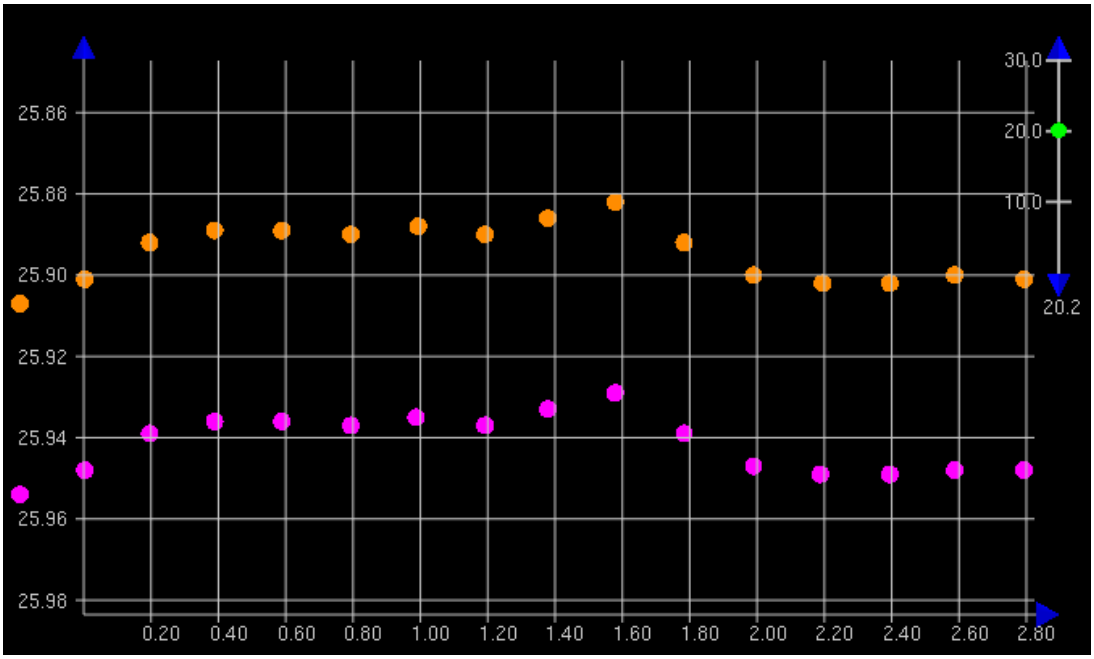

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> >
> > Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.
> >
> > Thanks,
> > Clint

Clint Marcus
Physical Scientist
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>
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>
> James J. Miller
> Physical Scientist

--
Janice Eisenberg
Physical Scientist
Hydrographic Systems and Technology Branch
NOAA Office of Coast Survey
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James J. Miller <james.j.miller@noaa.gov> Mon, Feb 13, 2017 at 9:39 PM
To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>
Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

Russell,

Thank you for the detailed information. I appreciate all the points you and Starla have discussed and your understanding on this issue.

If this was a tide-referenced survey, there would be no problem because SVC was applied after loading delayed heave and tides. In terms of SVC, I think of SBETs as providing a (potentially) refined solution, not the "correct" solution because there is always uncertainty in our measurements. The SBET provides refined attitude information for the ray tracing, but it does not provide a radically different solution compared to using raw attitude. This is why it had such a small effect on the soundings. And this is why I do not consider it a failure to meet specs.

A similar example would be if someone elected not to load delayed heave. Yes, we recommend loading delayed heave because it provides a smoother result, but failing to use it does not constitute a failure to meet specs.

I suppose this entire discussion hinges on what a blunder is, and what is covered by the uncertainty budget. Clearly we all agree that the recommended Caris workflow was not followed during OPR-G309-FH-16 because SVC was not re-applied after loading SBETs. Yet it is not clear to me that this fails the specs. To my knowledge, the specs provide minimum requirements for the data but they do not prohibit any processing mistakes.

In my opinion, failing to re-apply SVC after loading SBETs provided a less precise solution and introduced uncertainty to the sounding measurements. It did not introduce a static offset, since it made some soundings slightly deeper and others slightly shallower. The degree of uncertainty that was introduced is identical to it being a tide-referenced survey, since we would consider the raw attitude and delayed heave as adequate for SVC ray tracing in that case. Yet for this ERS project, we are saying that same practice fails to meet the specs.

In addition, the 2016 HSSD does distinguish between an error budget and an uncertainty budget (images below). I suppose it is debatable whether this issue falls within the description of sound speed errors in 5.2.3.5, but it is worth consideration.

Respectfully,
James

5.2.3.5 Error Budget Analysis for Depths

The hydrographer shall discuss (in Section B.2 of the Descriptive Report) the methods used to minimize the errors

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> What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.
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The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?

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Tyanne

On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

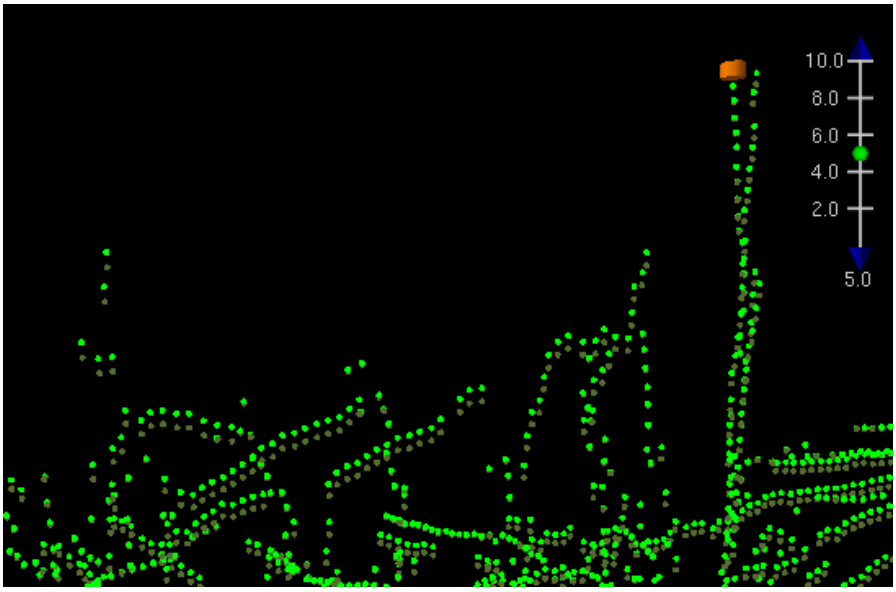
To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

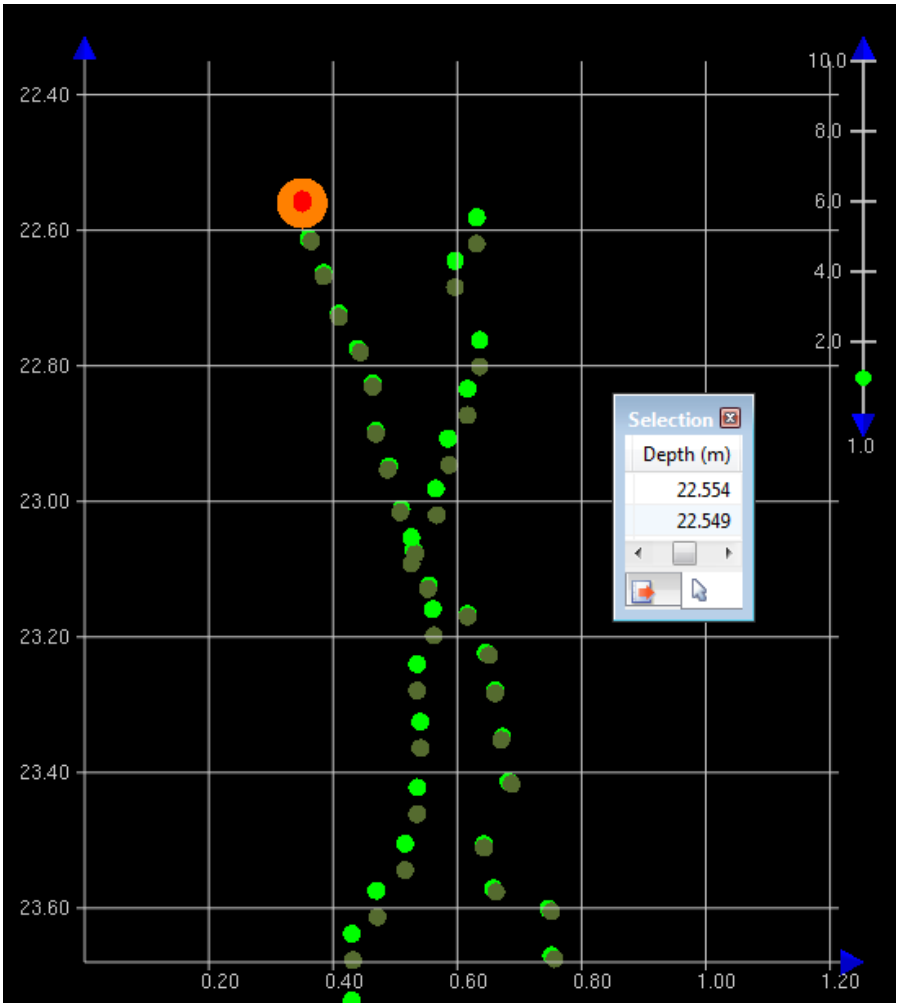
Sincerely,
Starla

On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey

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On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi all,

After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).

I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.

Looking at the data in subset, there was little to no difference between the two projects.

After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!

You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.

Hope this all helped.

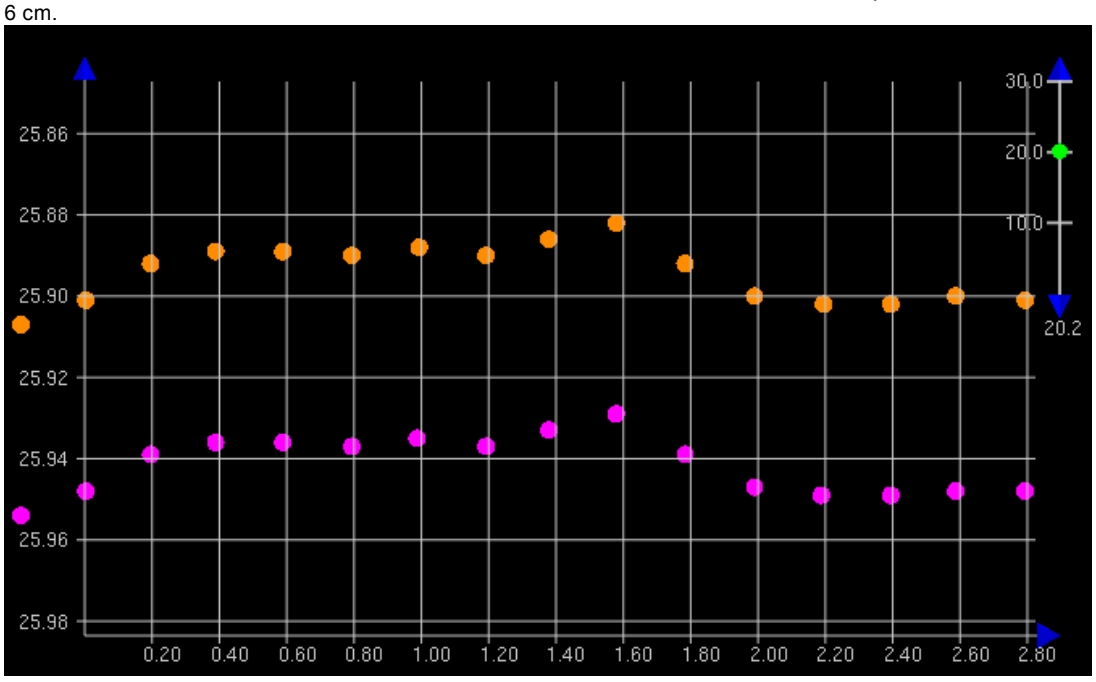
Cheers,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.

Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.



I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.

James J. Miller
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On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi Nick,
With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.

Cheers,

Clint Marcus
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Phone: (757) 441-6746 ext 208
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On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

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On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi everyone,

Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.

To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
<2017-02-08_17-14-54.png>

Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey

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On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Hi Starla,
>
> I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
>
> Let us know if you or HSD has any thoughts or recommendations on this.
>
> Thanks,
> -Nick

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hey Nick,
> Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.
>
> Cheers,
>
> Clint Marcus
> Physical Scientist
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> Atlantic Hydrographic Branch
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> Cell: (541) 264-6406

On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
>
> -Nick

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On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

> Hi all,
>
> As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
>
> Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
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On Tue, Feb 7, 20

...

[Message clipped]

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Tue, Feb 14, 2017 at 5:13 AM
To: "James J. Miller" <james.j.miller@noaa.gov>
Cc: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>, Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>, Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>, Robert Short - NOAA Federal <robert.short@noaa.gov>, Katrina Wyllie - NOAA Federal <katrina.wyllie@noaa.gov>

This is a good question.

The uncertainty budget accounts for random errors associated with our chosen method and tool of measurement, those assumptions are accounted for in the descriptive report and are recorded in the data as TVU. We can choose to use a less precise tool or method but its uncertainty assumptions have to be accounted for.

Not recalculating the beam steering from the SVC after the positional shift of SBETS incurs a static error similar to a calibration offset that is propagated to the depths. Because the error is not random it is not appropriate to account for it within the uncertainty budget.

The error budget is referencing specific sources of errors regardless of whether they are random or systematic. I believe "How the sound speed profile is used to convert measured time to depth.." is referring to the biases associated with the algorithms applied for beam steering, not the inputs put into those algorithm.

Could we write it off? When there is an artifact we can not easily rectify or diagnose we often use TVU as a way to measure an artifact's relative significance when we are discussing it in the DR. Sound speed artifacts are an example of this. We cannot correct them post acquisition with our current accepted procedures, so we document and quantify them in the DR to write them off. This error however, can be fixed so it should not be written off.

While I cannot find a "thou shall fix fixable errors" in the HSSD... I think that is the requirement. The closest I found was a reference at the end of the **5.2.4.3 Crosslines**, assuming the errors are fixed: "Conversely, any errors identified through crossline analysis and the means by which they were corrected shall be discussed."

I am working this problem out myself. Thank you for the discussion.

Sincerely,
Starla

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Russell,

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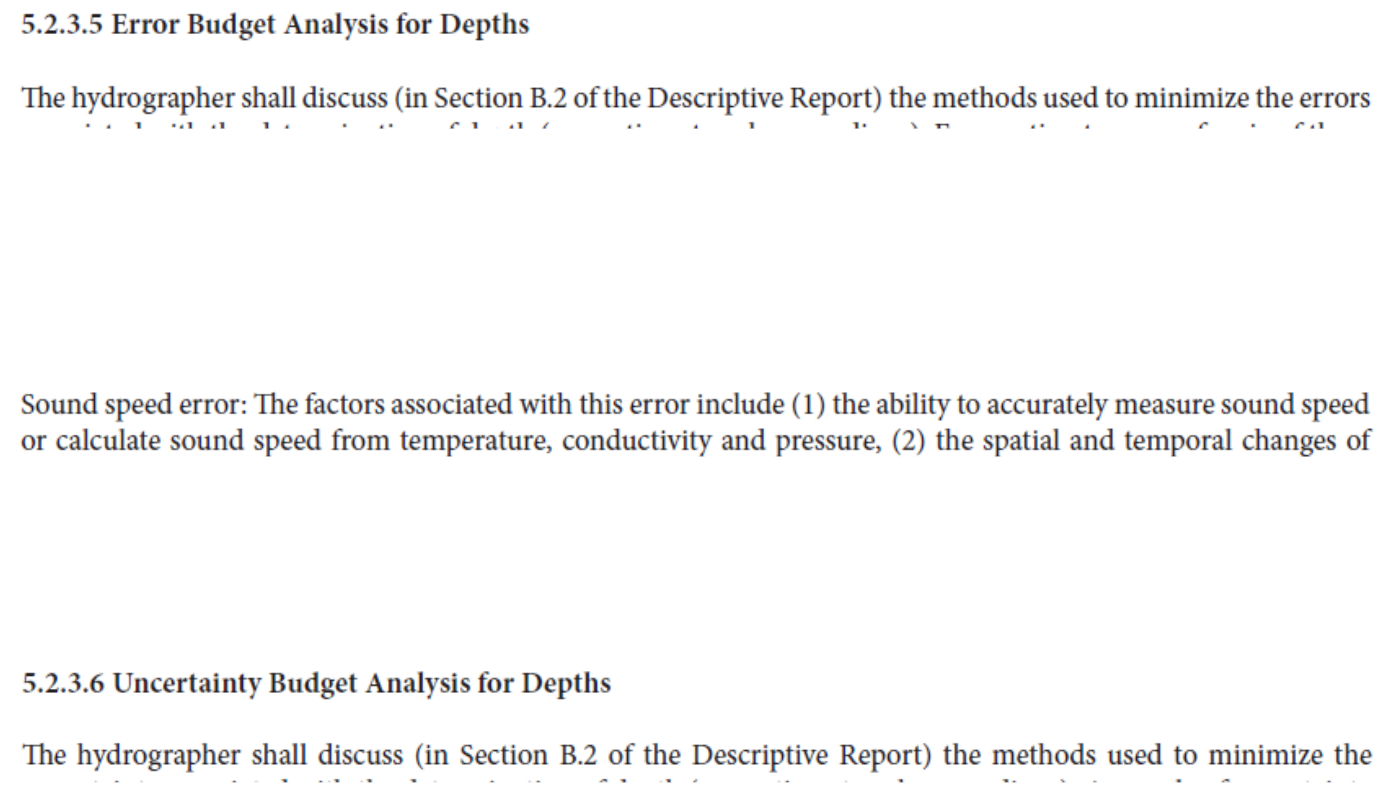

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Tyanne

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HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

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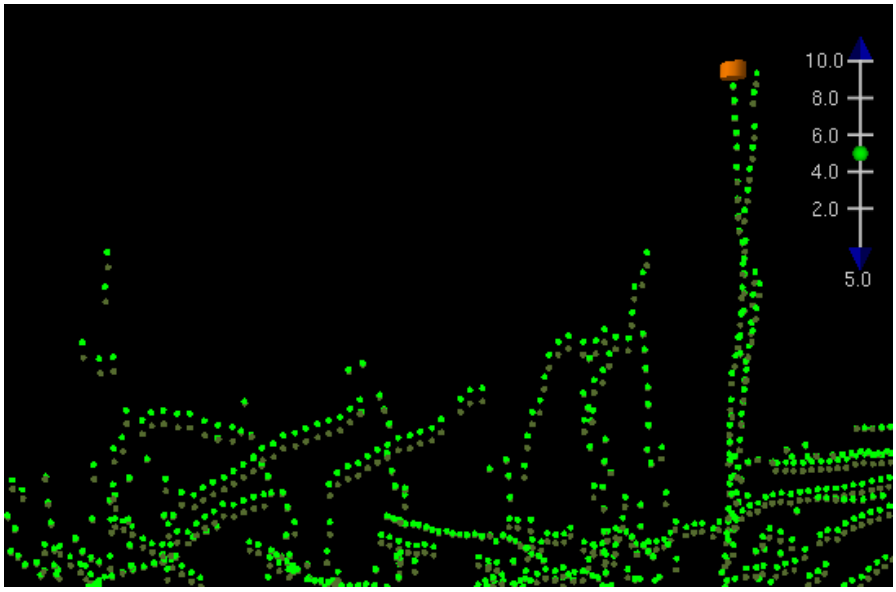
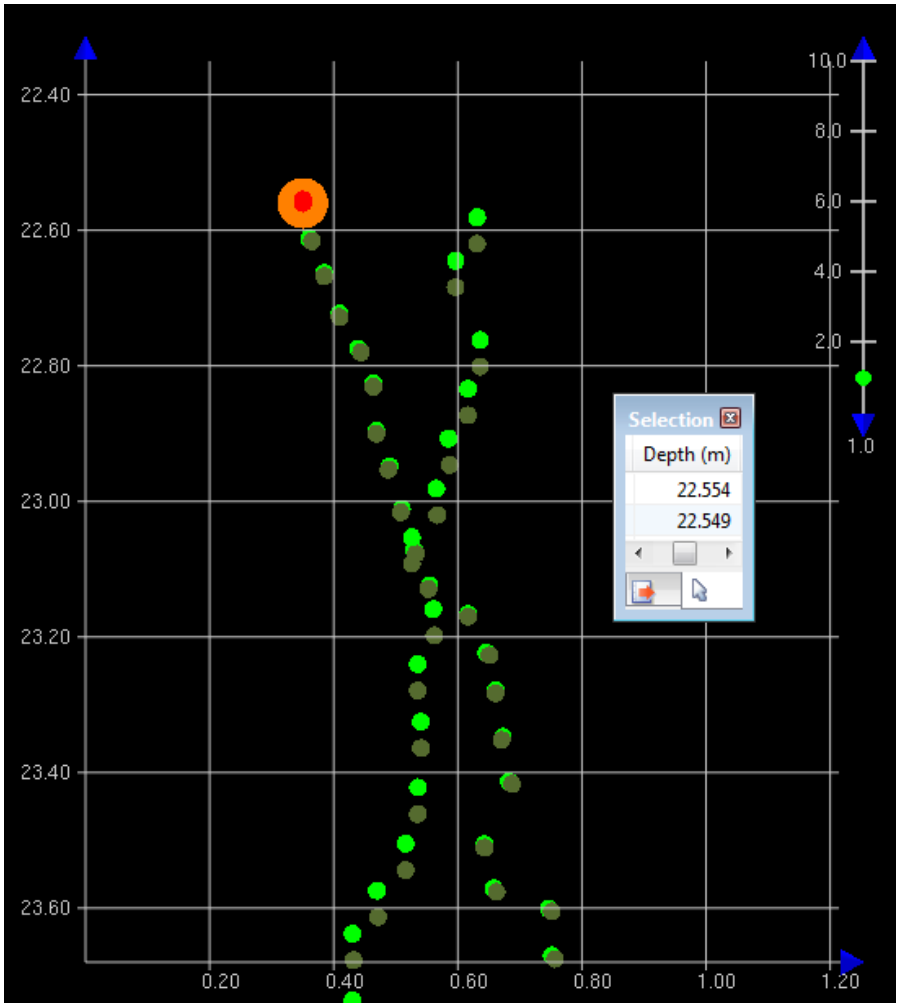
Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
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James J. Miller
Physical Scientist
NOAA Office of Coast Survey

Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi all,

After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).

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Looking at the data in subset, there was little to no difference between the two projects.

After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!

You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.

Hope this all helped.

Cheers,
Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.

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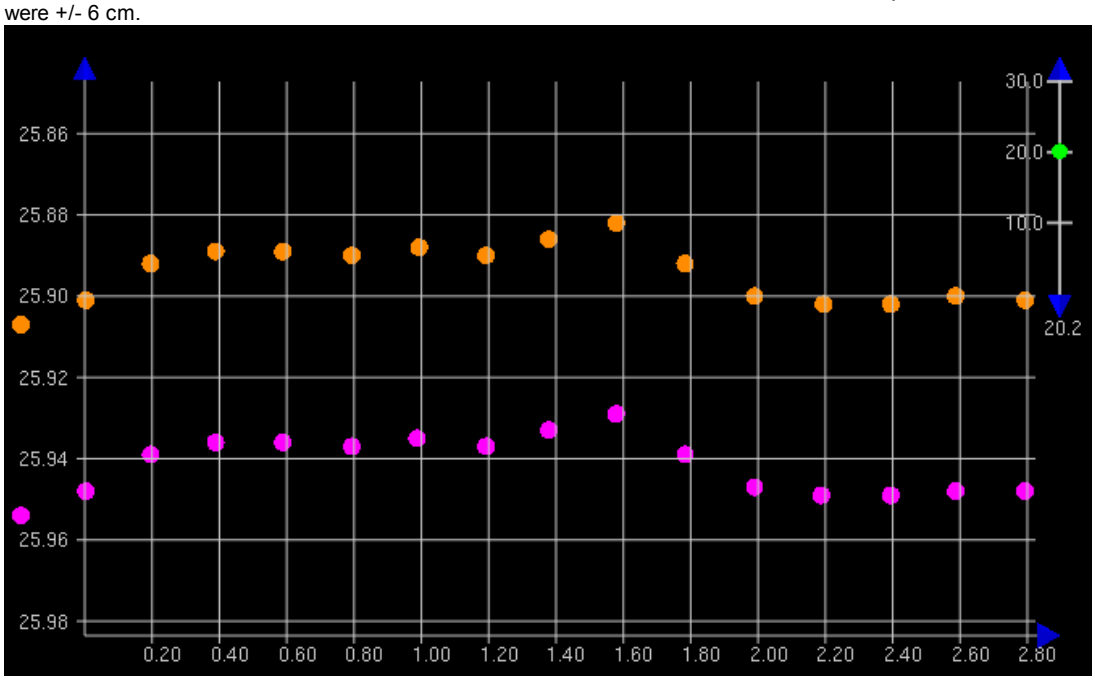

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With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.

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Cell: (541) 264-6406

On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.

Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
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On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi everyone,

Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.

To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
<2017-02-08_17-14-54.png>

Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?

Thanks,
James

James J. Miller
Physical Scientist

NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Hi Starla,
>
> I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
>
> Let us know if you or HSD has any thoughts or recommendations on this.
>
> Thanks,
> -Nick
>
> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Hey Nick,
> > > Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.
> > >
> > > Cheers,
> > >
> > > Clint Marcus
> > > Physical Scientist
> > > NOAA Office of Coast Survey
> > > Atlantic Hydrographic Branch
> > > Phone: (757) 441-6746 ext 208
> > > Cell: (541) 264-6406
> > >
> > > On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> > >
> > > > So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
> > > >
> > > > -Nick
> > > >
> > > > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > > > 29 Wentworth Road
> > > > New Castle, NH, 03854
> > > >
> > > > On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:
> > > >
> > > > > Hi all,
> > > > >
> > > > > As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
> > > > >
> > > > > Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.
>
> Cheers,
>
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406
>
> On Tue, Feb 7, 20

...

[Message clipped]

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Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: 301-713-2702 x125
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> Tue, Feb 14, 2017 at 8:03 AM
To: "James J. Miller" <james.j.miller@noaa.gov>
Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

James,

I think I should have been more precise in my language before. The issue is that this isn't a measurement error (difference from the Platonic "true" value) or an uncertainty, it's a blunder. We are all human, and our current organizational staffing has long hours and low experience levels as the rule, not the exception. These things will happen, and when they do, we need to fix them.

This isn't using a less precise method, like opting for PPP in lieu of dealing with a base station because of the operational losses from maintaining that station, or using raw nav instead of SBETs on a non-ERS survey.

Perhaps Caris 10 catches this, but I know it used to be possible to load preliminary tides, do all of your processing, then apply final tides, merge, and recompute without redoing SVC. However, having the wrong tide value changes where you are in the water column and produces an incorrect ray-trace. The values you get are wrong; not as a statistically less accurate value but because the operator made a mistake in process and (garbage in, garbage out) the algorithm accurately put out an erroneous value. The effect is usually small, but it is there and it is wrong.

These blunders do not get captured in the calculated TVU and do not get passed along. We know we made the mistake, we push it under the rug, and it disappears. Your test patches have found errors of up to 4cm so far; what's the max value that might be present in the dataset? How much do you need to reprocess to get a statistically valid sample of the whole survey to make the statement that we have a 95% confidence that the errors from this are less than x cm? Do we then add that as a static contribution to the TVU (call it a bias), recompute TVU, remerge, and recompute the surfaces? That would accurately capture the bias from this blunder...but it also sounds like more work than just redoing it correctly.

No one enjoys being pedantic (that's probably not true, but I certainly don't). I also don't think it's in my purview to waive blunders; which makes this not my call. I consulted with Captain Brennan yesterday before Starla responded, and the decision was his. If AHB really thinks FH shouldn't have to reprocess this, I'm not sure on the process there but I imagine it goes through getting Bri or Jasko to request that Captain Brennan reconsider. Maybe it's a topic for the Chief's Meeting, but I can't overrule his decision and I'm not the one to advocate for this even if I was convinced and neither is Starla.

V/r,
Russ

Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

On Mon, Feb 13, 2017 at 9:39 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Russell,

Thank you for the detailed information. I appreciate all the points you and Starla have discussed and your understanding on this issue.

If this was a tide-referenced survey, there would be no problem because SVC was applied after loading delayed heave and tides. In terms of SVC, I think of SBETs as providing a (potentially) refined solution, not the "correct" solution because there is always uncertainty in our measurements. The SBET provides refined attitude information for the ray tracing, but it does not provide a radically different solution compared to using raw attitude. This is why it had such a small effect on the soundings. And this is why I do not consider it a failure to meet specs.

A similar example would be if someone elected not to load delayed heave. Yes, we recommend loading delayed heave because it provides a smoother result, but failing to use it does not constitute a failure to meet specs.

I suppose this entire discussion hinges on what a blunder is, and what is covered by the uncertainty budget. Clearly we all agree that the recommended Caris workflow was not followed during OPR-G309-FH-16 because SVC was not re-applied after loading SBETs. Yet it is not clear to me that this fails the specs. To my knowledge, the specs provide minimum requirements for the data but they do not prohibit any processing mistakes.

In my opinion, failing to re-apply SVC after loading SBETs provided a less precise solution and introduced uncertainty to the sounding measurements. It did not introduce a static offset, since it made some soundings slightly deeper and others slightly shallower. The degree of uncertainty that was introduced is identical to it being a tide-referenced survey, since we would consider the raw attitude and delayed heave as adequate for SVC ray tracing in that case. Yet for this ERS project, we are saying that same practice fails to meet the specs.

In addition, the 2016 HSSD does distinguish between an error budget and an uncertainty budget (images below). I suppose it is debatable whether this issue falls within the description of sound speed errors in 5.2.3.5, but it is worth consideration.

Respectfully,
James

5.2.3.5 Error Budget Analysis for Depths

The hydrographer shall discuss (in Section B.2 of the Descriptive Report) the methods used to minimize the errors

Sound speed error: The factors associated with this error include (1) the ability to accurately measure sound speed or calculate sound speed from temperature, conductivity and pressure, (2) the spatial and temporal changes of

5.2.3.6 Uncertainty Budget Analysis for Depths

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On Mon, Feb 13, 2017 at 7:54 PM, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.

That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.

We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.

This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.

We stand by ready to concur with a request to waive redoing the analysis if the reprocessed data is barely different. We have no desire to be punitive here, and we have every reason to strive to make both the field and office as efficient as possible. We are extremely sympathetic and Starla and I both worked on the wording of the bad news email to ensure it didn't come across as negative in any way; but that doesn't change that the right answer is to make it right.

Very Respectively,
Russell

On Mon, Feb 13, 2017 at 19:30 Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

> How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

On Mon, Feb 13, 2017 at 4:17 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

> Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.
>
> Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.
>
> Sincerely,
> Starla

On Mon, Feb 13, 2017 at 6:34 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?
>
> The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111

On Mon, Feb 13, 2017 at 5:52 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

> I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).
>
> Tyanne

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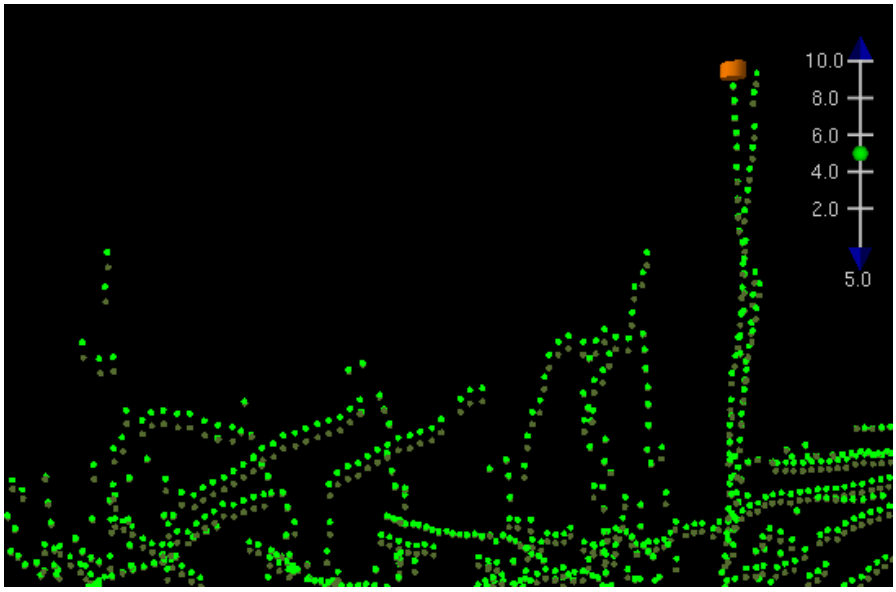

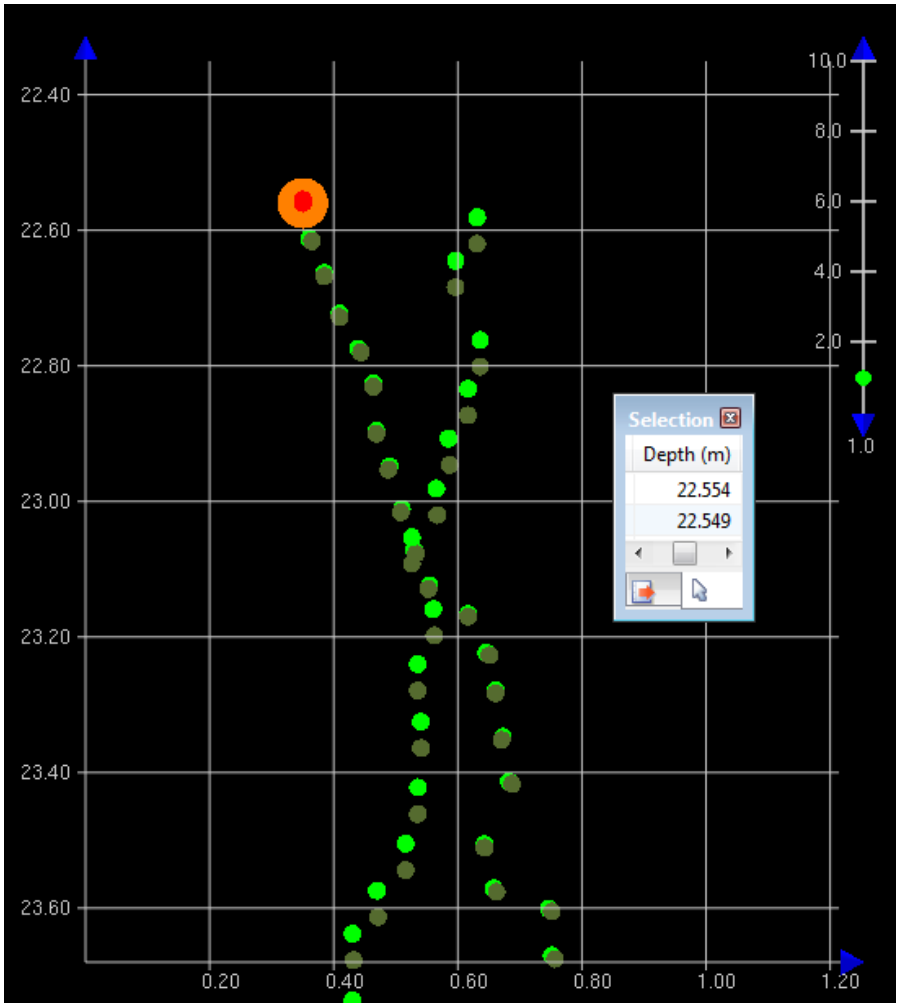

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Hope this all helped.

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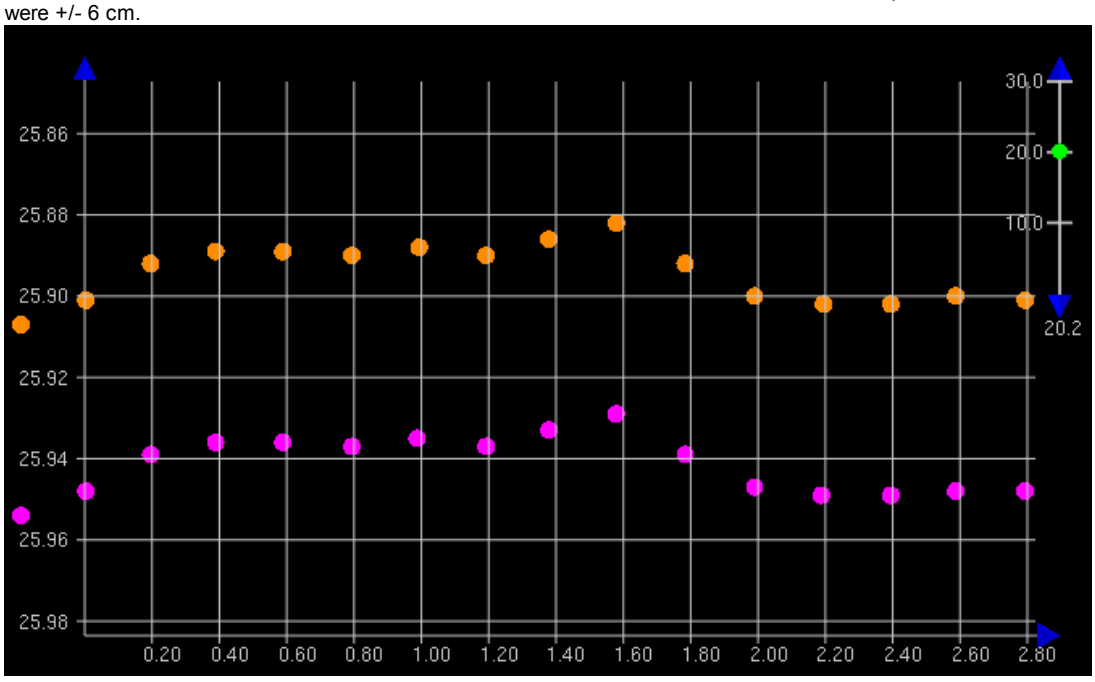

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> Cheers,
>
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
> Cell: (541) 264-6406
>
> On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.
> >
> > Nick
> >
> > On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > Hi James, et. al.
> >
> > I ran a small subset of lines (8) on H12843 that were developement lines over a wreck. I made a local project and took the lines through the entire processing workflow and re-SVC'd after the application of SBETs. I created a combined 2m surface which I then differenced with the field submitted combined surface. The result was that 95% of nodes had a +/- 6cm difference. There were localized differences of up to 52cm over the wreck. Unfortunately, I did not difference the soundings before and after the post-SBET SVC. I believe Gene and Bri were going to talk about how to proceed with H12843.
> >
> > Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.
> >
> > Thanks,
> > Clint
> >
> > Clint Marcus
> > Physical Scientist
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> >
> > On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:
> >
> > > Hi everyone,
> > >
> > > Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.
> > >
> > > To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.
> > > <2017-02-08_17-14-54.png>
> > >
> > > Clint, what did your reprocessed test lines show on survey H12843? How large were the vertical offsets between running SVC before or after loading SBETs? Greater than 1 cm?
> > >
> > > Thanks,
> > > James
> > >
> > > James J. Miller
> > > Physical Scientist

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Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Wed, Feb 8, 2017 at 8:54 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:

> Hi Starla,
>
> I just wanted to bring you in the loop. Clint found an error in our processing workflow during a SAR of H12843 (2015 Chesapeake) that involved not re-applying SV after applying SBETs. James Miller did a test with our Wilmington data that compared data without SV after SBETs and with SV after SBETs. In his test, we found that the difference is only on the order of about 1cm. It sounds like AHB is going to run a quick test of their own to see if they get similar results. We will have to figure out a course of action on this. We expect it to be a drop in the bucket in terms of the total uncertainty but we'll see.
>
> Let us know if you or HSD has any thoughts or recommendations on this.
>
> Thanks,
> -Nick
>
> Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> 29 Wentworth Road
> New Castle, NH, 03854
>
> On Wed, Feb 8, 2017 at 7:59 AM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Ok, James just did a comparison with some of our Wilmington data and found that the difference was ~1cm generally. It's a limited sample size but he can probably share the results with you shortly.
> >
> > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > 29 Wentworth Road
> > New Castle, NH, 03854
> >
> > On Wed, Feb 8, 2017 at 7:00 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:
> >
> > > Hey Nick,
> > > Just got done talking with Gene. We're gonna try a few test lines and compare the difference before we would move forward with re-processing the entire survey. Basically, the same thing James is doing out there for you. Thanks again for looking into that.
> > >
> > > Cheers,
> > >
> > > Clint Marcus
> > > Physical Scientist
> > > NOAA Office of Coast Survey
> > > Atlantic Hydrographic Branch
> > > Phone: (757) 441-6746 ext 208
> > > Cell: (541) 264-6406
> > >
> > > On Tue, Feb 7, 2017 at 4:51 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
> > >
> > > > So we got a quick response from Caris that SVC does need to happen after applying new attitude/nav data such as an SBET. I did a quick check of our 2016 Chesapeake Surveys and those seem to be processed that way so that's good. However, our 2016 Wilmington surveys are all processed without SVC after SBETs. I believe we may end up going back for those and re-applying SV. James is doing a brief comparison to see what kind of difference we see in the data between the two. I imagine though that it varies survey to survey as to how different your SBET is from your original POS data.
> > > >
> > > > -Nick
> > > >
> > > > Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
> > > > 29 Wentworth Road
> > > > New Castle, NH, 03854
> > > >
> > > > On Tue, Feb 7, 2017 at 2:35 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:
> > > >
> > > > > Hi all,
> > > > >
> > > > > As far as I remember SVC is not required again unless you are using a Kongsberg system. I will try to dig up the email if I have one...
> > > > >
> > > > > Tyanne

On Tue, Feb 7, 2017 at 11:34 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Thanks for the quick reply. I'll be standing by to see what CARIS has to say. Thanks again.

Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Tue, Feb 7, 20

...

[Message clipped]

Briana Welton - NOAA Federal <briana.welton@noaa.gov> Tue, Feb 14, 2017 at 11:24 AM
To: Russell Quintero - NOAA Federal <russell.quintero@noaa.gov>
Cc: "James J. Miller" <james.j.miller@noaa.gov>, CO HASSLER <co.ferdinand.hassler@noaa.gov>, "OPS.Ferdinand Hassler - NOAA Service Account" <ops.ferdinand.hassler@noaa.gov>, Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>, Grant Froelich <grant.froelich@noaa.gov>, Janice Eisenberg - NOAA Federal <janice.eisenberg@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, Erin Weller - NOAA Federal <erin.weller@noaa.gov>, Matthew Wilson <Matthew.Wilson@noaa.gov>

All,

A couple points:

1.) On what appears to be the original question of, "Would we have a contractor re-do this?," the answer is, "No," because we don't have contractors do ellipsoidally referenced surveys. The surveys as processed would have been perfectly acceptable for any NOAA field unit not doing ERS and are perfectly acceptable now for a KR survey.

2.) On the question of whether this is tolerable measurement uncertainty or measurement error, I don't think that's the right question to ask. It's a question of what is an acceptable processing workflow, and therefore is a matter of best practice versus acceptable practice. I agree that the SBET solution is most often better, which is why we prescribe it, but it's not the only solution. We can always do better, but at what cost? This is a question of, "Is it good enough?," and I argue that the answer to that question is yes. The different depth solutions are coming from where in the water column we measured the MBES to be at the time of transmit and receive (the difference between pitch, roll, and heave of the unprocessed .000 file and the processed .SBET file) and those measurement impacts on the modeled/estimated ray path of each beam to and from the seafloor. The vertical and horizontal launch position and the launch angle may be slightly different, which may change which sound speed cast is applied and which cast value is applied to the initial launch angle. Yes, SBETs would theoretically result in a better depth solution, but there are a lot of other things that we *could but don't do* to make the solution better, such as: use a better beam configuration, use a better seafloor detection algorithm, use a better beam steering algorithm, use a better ray tracing algorithm, use a better ray tracing model (something other than the cave man method), etc, because they cost too much. There are five (5) surveys at AHB that have been processed this way, one of which is already in compilation, and ten (10) on FH. Reprocessing 15 surveys for this reason doesn't seem like a good use of resources to me.

3.) I would like to discuss further with HSD Chief. AHB will do whatever is decided, but based on this email chain I don't believe the situation has been considered sufficiently or completely. As Gene just wisely told me, we'll get paid either way.

4.) What is the status of hiring dedicated survey personnel for FH?

V/r,

Bri

On Tue, Feb 14, 2017 at 8:03 AM, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

James,

I think I should have been more precise in my language before. The issue is that this isn't a measurement error (difference from the Platonic "true" value) or an uncertainty, it's a blunder. We are all human, and our current organizational staffing has long hours and low experience levels as the rule, not the exception. These things will happen, and when they do, we need to fix them.

This isn't using a less precise method, like opting for PPP in lieu of dealing with a base station because of the operational losses from maintaining that station, or using raw nav instead of SBETs on a non-ERS survey.

Perhaps Caris 10 catches this, but I know it used to be possible to load preliminary tides, do all of your processing, then apply final tides, merge, and recompute without redoing SVC. However, having the wrong tide value changes where you are in the water column and produces an incorrect

ray-trace. The values you get are wrong; not as a statistically less accurate value but because the operator made a mistake in process and (garbage in, garbage out) the algorithm accurately put out an erroneous value. The effect is usually small, but it is there and it is wrong.

These blunders do not get captured in the calculated TVU and do not get passed along. We know we made the mistake, we push it under the rug, and it disappears. Your test patches have found errors of up to 4cm so far; what's the max value that might be present in the dataset? How much do you need to reprocess to get a statistically valid sample of the whole survey to make the statement that we have a 95% confidence that the errors from this are less than x cm? Do we then add that as a static contribution to the TVU (call it a bias), recompute TVU, remerge, and recompute the surfaces? That would accurately capture the bias from this blunder...but it also sounds like more work than just redoing it correctly.

No one enjoys being pedantic (that's probably not true, but I certainly don't). I also don't think it's in my purview to waive blunders; which makes this not my call. I consulted with Captain Brennan yesterday before Starla responded, and the decision was his. If AHB really thinks FH shouldn't have to reprocess this, I'm not sure on the process there but I imagine it goes through getting Bri or Jasko to request that Captain Brennan reconsider. Maybe it's a topic for the Chief's Meeting, but I can't overrule his decision and I'm not the one to advocate for this even if I was convinced and neither is Starla.

V/r,
Russ

Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
1315 East-West Hwy, SSMC3 6217
Silver Spring, MD 20910
Cell: 970-481-2030

On Mon, Feb 13, 2017 at 9:39 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Russell,
>
> Thank you for the detailed information. I appreciate all the points you and Starla have discussed and your understanding on this issue.
>
> If this was a tide-referenced survey, there would be no problem because SVC was applied after loading delayed heave and tides. In terms of SVC, I think of SBETs as providing a (potentially) refined solution, not the "correct" solution because there is always uncertainty in our measurements. The SBET provides refined attitude information for the ray tracing, but it does not provide a radically different solution compared to using raw attitude. This is why it had such a small effect on the soundings. And this is why I do not consider it a failure to meet specs.
>
> A similar example would be if someone elected not to load delayed heave. Yes, we recommend loading delayed heave because it provides a smoother result, but failing to use it does not constitute a failure to meet specs.
>
> I suppose this entire discussion hinges on what a blunder is, and what is covered by the uncertainty budget. Clearly we all agree that the recommended Caris workflow was not followed during OPR-G309-FH-16 because SVC was not re-applied after loading SBETs. Yet it is not clear to me that this fails the specs. To my knowledge, the specs provide minimum requirements for the data but they do not prohibit any processing mistakes.
>
> In my opinion, failing to re-apply SVC after loading SBETs provided a less precise solution and introduced uncertainty to the sounding measurements. It did not introduce a static offset, since it made some soundings slightly deeper and others slightly shallower. The degree of uncertainty that was introduced is identical to it being a tide-referenced survey, since we would consider the raw attitude and delayed heave as adequate for SVC ray tracing in that case. Yet for this ERS project, we are saying that same practice fails to meet the specs.
>
> In addition, the 2016 HSSD does distinguish between an error budget and an uncertainty budget (images below). I suppose it is debatable whether this issue falls within the description of sound speed errors in 5.2.3.5, but it is worth consideration.
>
> Respectfully,
> James

5.2.3.5 Error Budget Analysis for Depths

The hydrographer shall discuss (in Section B.2 of the Descriptive Report) the methods used to minimize the errors

Sound speed error: The factors associated with this error include (1) the ability to accurately measure sound speed or calculate sound speed from temperature, conductivity and pressure, (2) the spatial and temporal changes of

5.2.3.6 Uncertainty Budget Analysis for Depths

The hydrographer shall discuss (in Section B.2 of the Descriptive Report) the methods used to minimize the

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
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On Mon, Feb 13, 2017 at 7:54 PM, Russell Quintero - NOAA Federal <russell.quintero@noaa.gov> wrote:

> What if the mistake was a tide file with a 1m static offset? MHHW instead of MLLW, for example. All internal checks line up, no statistical issues...passes all of our QC until a sharp-eyed PS notices it during SAR.
>
> That's a clear blunder, and it "blows spec." If it's only a 0.2m offset? That's still not within spec, because it's an Uncertainty Budget, not an Error Budget. Mistakes don't get a pass just for being small enough.
>
> We made another ship reconvert lines because they used the wrong datum for a handful of lines, even though the induced offset was minor. We would have done the same even if it was most of their survey. Mistakes have to be fixed.
>
> This one is really unsatisfying all around because it's the perfect storm of a small effect affecting a large volume of data...but being inconvenient doesn't change that the right answer is still right. If this was a contractor, our answer would be the same; even if it risked making that TO unprofitable. We don't have to worry about turning a profit, just a never ending pile of work we would rather work on, but our answer has to be consistent.
>
> We stand by ready to concur with a request to waive redoing the analysis if the reprocessed data is barely different. We have no desire to be punitive here, and we have every reason to strive to make both the field and office as efficient as possible. We are extremely sympathetic and Starla and I both worked on the wording of the bad news email to ensure it didn't come across as negative in any way; but that doesn't change that the right answer is to make it right.
>
> Very Respectively,
> Russell

On Mon, Feb 13, 2017 at 19:30 Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

> How about adding rednotes to all the surveys that differ from the DAPR? As James said these errors are on the magnatude of centimeters. When a contractor sent in data with the wrong TVU calculated this made all surfaces fail TVU specifications. We are talking about apples and oranges here.

On Mon, Feb 13, 2017 at 4:17 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

> Precisely James, we would have the contractor fix it. We had a contractor resubmit a year's worth of data for having the wrong TVU values. It was an error. It had to be fixed.
>
> Given the amount of effort we all put into this it is hard to have this delay. Correcting blunders is a cost of doing business, regardless of whether a contractor or a ship is responsible for the product. I know we are eager for the finish line but it is a bit further. I have added CMD Welton and LT Quintero in case they have any ideas to add to how we can help get there.
>
> Sincerely,
> Starla

On Mon, Feb 13, 2017 at 6:34 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

> If this exact same situation applied to a contractor, would OPS require the contractor to re-process the data?
>
> The error predominantly ranges from 0.5 - 1cm, with the occasional difference reaching 4cm. The vast majority of the project coverage will only affect a small-scale fathoms chart (1:432,000) where the error is unlikely to change the rounded depths on the chart. Processing and personnel resources are limited on the Hassler. Do we really think it is prudent and worthwhile to spend our limited time this way?
>
> James J. Miller
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> 439 W York St | Norfolk, VA | 23510
> 757-441-6746 x 111

On Mon, Feb 13, 2017 at 5:52 PM, Tyanne Faulkes - NOAA Federal <tyanne.faulkes@noaa.gov> wrote:

I am currently out sick. When I get back to the office I will talk to Ben to see if I can work with AHB and the FH to fix the surveys that I was survey manager on (I think there were three).

Tyanne

On Mon, Feb 13, 2017 at 2:47 PM Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> wrote:

HSD understands the desire to not reprocess this data, however after much soul searching and deliberation including consultation with the Chief of HSD... reprocess the data. The TVU budget is not for blunders. Captain Brennan has requested that the ship provide a plan on how to resolve this in a timely manner.

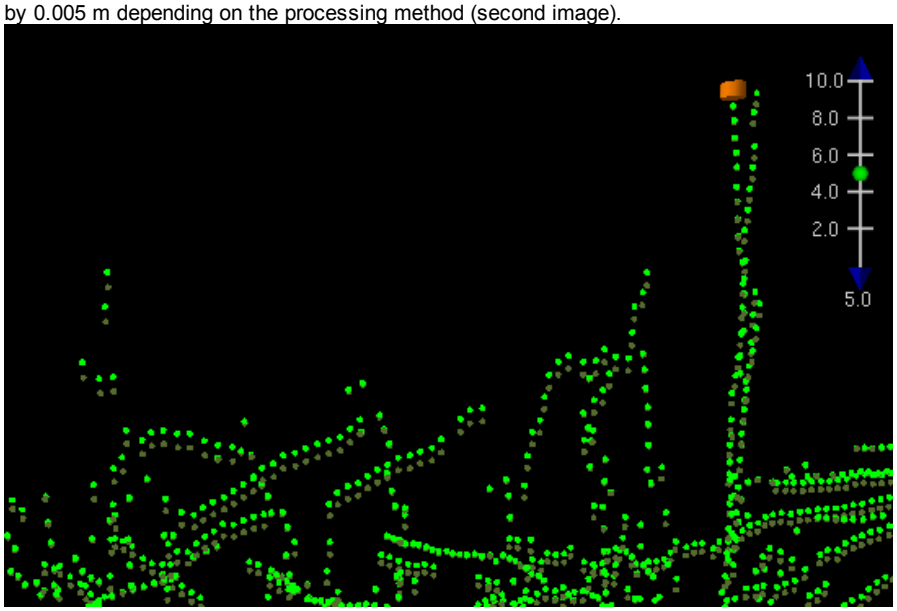
To help speed things up, we think you could do a difference surface of the final surfaces with the previous products. By showing there is no statistically significant difference between the two surfaces, you could make the argument that the analysis (cross-lines, junctions, and chart comparisons) does not need to be redone. HSD can then issue a waiver concurring with this.

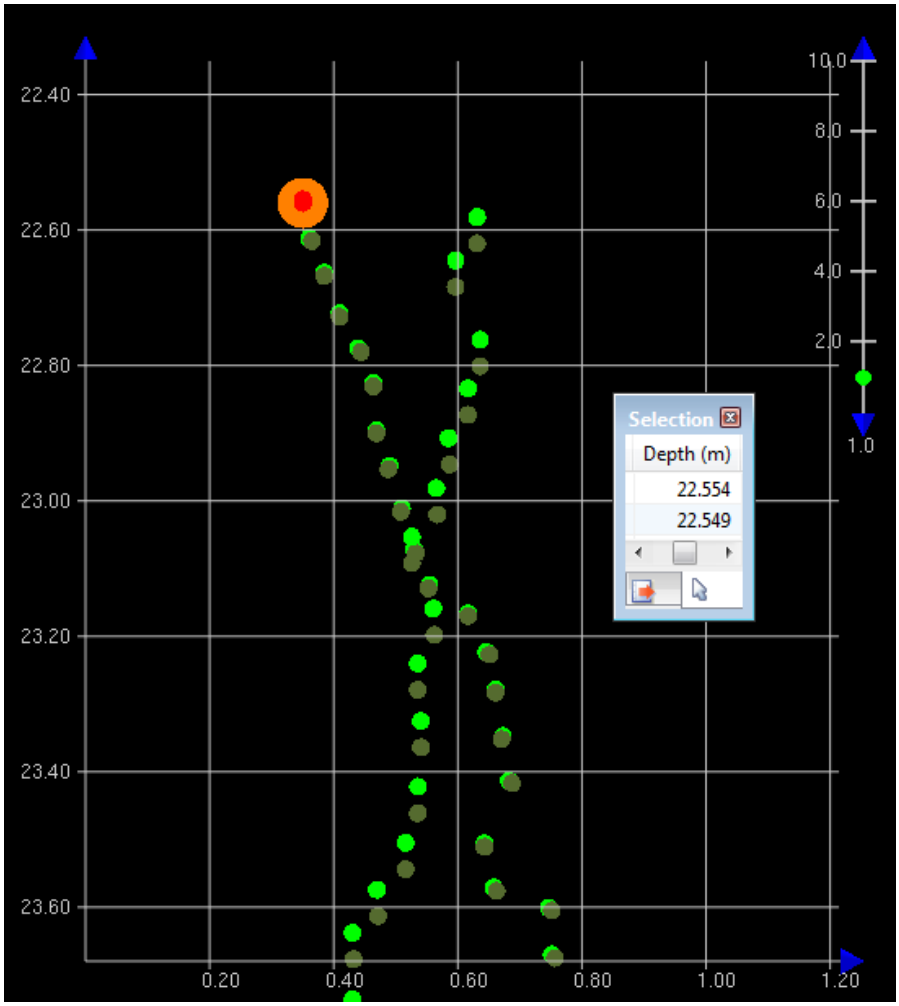
Sincerely,
Starla

On Thu, Feb 9, 2017 at 12:35 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi Clint,

Our testing is consistent with your findings. Survey H12859 has one wreck that we used for additional testing. The vertical difference between processing methods ranged from 0.005 - 0.040 m over the wreck. The least depth of the wreck would change by 0.005 m depending on the processing method (second image).





Survey H12932 (OPR-G309-FH-16) has one wreck that we tested. The vertical differences between processing methods were even smaller, ranging from 0.004 - 0.010 m. The least depth of the wreck would change by 0.004 m depending on the processing method.

We are relieved that prepossessing appears to be unnecessary for H12843 and OPR-G309-FH-16. Thanks again for identifying this problem and helping with the testing.

Thanks,
James

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
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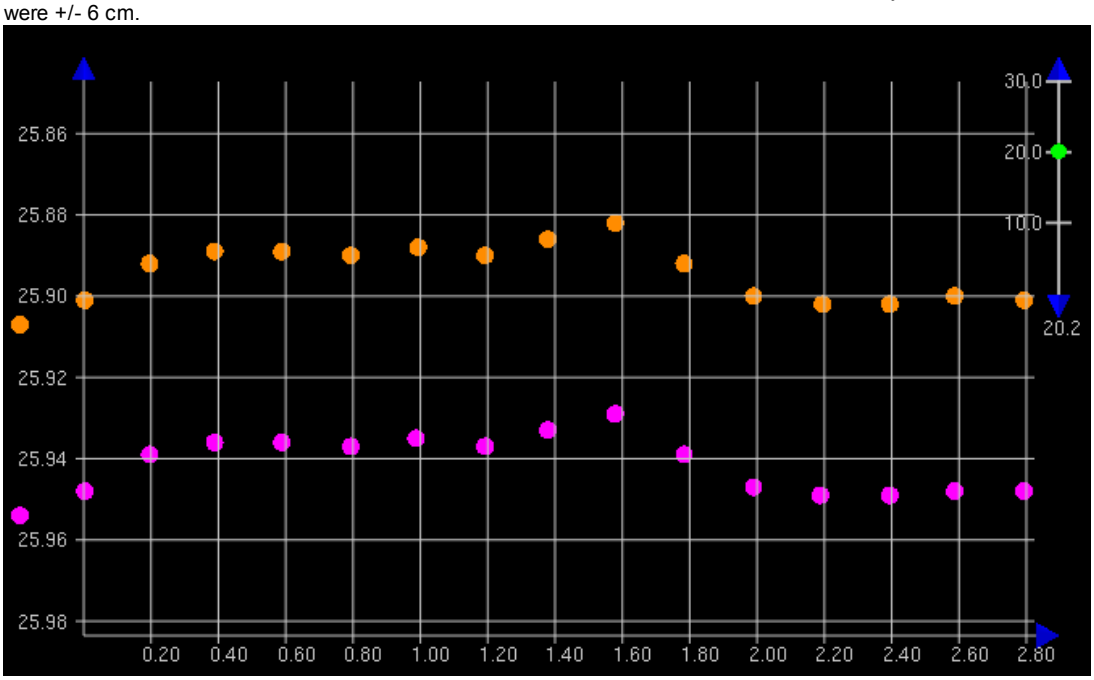
On Thu, Feb 9, 2017 at 12:23 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi all,
>
> After taking another sub-section of H12843 for reprocessing, it was found that 95% of the nodes were +/- 2cm. I will go so far as to say the difference would likely be even smaller if I had filtered the one XL present, which is what the FH did (I believe).
>
> I took a total of 37 lines in an area of general bathymetry (no features) and followed the same procedure as previously noted. Taking the data from conversion thru SBETs, and re-applying SVC after SBETs.
>
> Looking at the data in subset, there was little to no difference between the two projects.
>
> After talking with Gene, we determined that it would not be necessary to reprocess the entire survey for such a small difference. Yay!
>
> You might want to just double check with them (CO, Gene, Bri), but I don't think it is necessary for you to go back and reprocess the OPR-G309-FH-16 data.
>
> Hope this all helped.
>
> Cheers,

Clint Marcus
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Phone: (757) 441-6746 ext 208
Cell: (541) 264-6406

On Thu, Feb 9, 2017 at 9:12 AM, James J. Miller <james.j.miller@noaa.gov> wrote:

> Hi Clint,
>
> Thanks for all the helpful information and screen shots. For your next test subset, I think it would be worth comparing the original survey lines (re-SVC not conducted after SBETs) to the test lines at the sounding level in Subset Editor. When comparing surfaces, they often exhibit apparent vertical differences along slopes and features due to small horizontal shifts, rather than actual vertical changes. We are curious about the magnitude of the vertical difference between the soundings.
>
> Even though survey H12859 was not affected by this issue because SVC was run after loading SBETs, we conducted a test because it is in the vicinity of H12843. We re-processed test copies of the H12859 crosslines and did not re-SVC after loading SBETs. As viewed in Subset Editor, the vertical difference between processing methods mostly ranged from 2-3 cm and reached a maximum of 5 cm in some areas. This seems similar to the H12843 difference surface where you found that 95% of nodes were +/- 6 cm.



> I will follow your lead and try testing a couple features on H12859 and the OPR-G309-FH-16 surveys. Worth checking how the least depths are affected.

James J. Miller
Physical Scientist
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
439 W York St | Norfolk, VA | 23510
757-441-6746 x 111

On Thu, Feb 9, 2017 at 7:42 AM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

> Hi Nick,
> With the soundings all being from development lines, there is good parity within the data. The soundings were for the most part all of a Quality Flag of 3. We are going to process another subset of H12843 to help validate our findings. The screen shot attached is of a subset over the wreck showing the density of soundings. We'll keep you posted with our findings.
>
> Cheers,
>
> Clint Marcus
> Physical Scientist
> NOAA Office of Coast Survey
> Atlantic Hydrographic Branch
> Phone: (757) 441-6746 ext 208
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>
> On Wed, Feb 8, 2017 at 8:26 PM, OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> wrote:
>
> > Also, it could be possible that a horizontal change in position of the soundings could exacerbate the vertical difference in a sharp feature like a wreck but correct me if I'm wrong.

Nick

On Feb 8, 2017, at 6:32 PM, Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov> wrote:

Hi James, et. al.

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Hope that helps in the decision making process. I don't have the data in front of me, unfortunately, so I don't have any screen grabs available. I can send some out in the morning when I get to the office.

Thanks,
Clint

Clint Marcus
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On Wed, Feb 8, 2017 at 6:11 PM, James J. Miller <james.j.miller@noaa.gov> wrote:

Hi everyone,

Thank you Clint for identifying this issue. And thank you all for clarifying that the proper workflow is to run (or re-run) SVC after loading the SBET if gyro, pitch, roll, heave or GPS height are applied. Unfortunately, this workflow was not followed during project OPR-G309-FH-16, which consists of 8 surveys and over 500 SNM of coverage. This issue is also relevant for the survey Clint is reviewing (H12843). Due to the large amount of data that is affected, it would take a significant amount of time to re-run SVC, re-Merge, re-check the designated soundings, and re-compute the grids. So in the interest of saving time, we were curious whether the problem is small enough to be documented in the DRs without reprocessing the data.

To asses the magnitude of the problem, we re-processed test copies of the crosslines for several surveys in project OPR-G309-FH-16 and conducted a comparison between running SVC before or after applying SBETs. As viewed in Subset Editor, the vertical difference between these methods did not exceed 1 cm (see image below), even in the outermost beams which exhibited larger offsets than nadir beams (as expected). Depths ranged from 20-45 m. At least from our testing on project OPR-G309-FH-16, the magnitude of the offset is small enough that reprocessing does not seem worthwhile.

...

[Message clipped]

--
LCDR Briana Welton, NOAA
Office of Coast Survey
Chief, Atlantic Hydrographic Branch
439 W York St, Norfolk, VA 23510
office: 757-441-6746, ext 200
cell: 520-227-9269

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

Feburary 15, 2017

MEMORANDUM FOR: LCDR Matthew Jaskowski, NOAA
Commanding Officer, NOAA Ship *Ferdinand R. Hassler*

FROM: Lieutenant Russell Quintero, NOAA
Chief, Hydrographic Surveys Division

SUBJECT: OPR-G309-FH-16 ERS Capability Memorandum, Approaches to Wilmington

Hydrographic surveys for OPR-G309-FH-17, Approaches to Wilmington, are approved for vertical reduction to chart datum, Mean Lower Low Water (MLLW), using the NOAA ellipsoidally-referenced zoned tides (ERZT) model.

Approval of ERZT, in lieu of the NOAA Center for Operational Oceanographic Products and Services (CO-OPS) traditional discrete zoned tides package as per the Project Instructions, is based on your recommendation and the review of comparison results you included in your attached email from Feburary, 15, 2017.

The results of the data analysis show that ellipsoidally referenced survey (ERS) techniques with ERZT used as the vertical datum reducer meet or exceed horizontal and vertical specifications for hydrographic surveys.

The comparison techniques are in line with the procedures outlined in the NOS Hydrographic Surveys Specifications and Deliverables document.

You shall include a description of your ERS processing procedures and the comparisons you conducted between ERS and traditional tides in the appropriate Descriptive Report (DR), Horizontal and Vertical Control Report and/or Data Acquisition and Processing Report. As appropriate in the DR, document specific vessel day(s) or line(s) that have not been processed using ERS techniques as the vertical reducer to MLLW, where discrete zoning provides better results and/or where vertical uncertainties of your post processed vertical positional data are out of the range determined by the HSSD 2016.

Include this memo in the supplemental correspondence Appendix of the DR.

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov>

NOAA Ship Hassler SV Correct

9 messages

Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov> Wed, Feb 15, 2017 at 10:11 AM
To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski,

I have reviewed the technical details associated with the situation surrounding the Hassler surveys that are currently in question. As currently understood, there are approximately 16 surveys between AHB and Hassler. The issue, as I understand it in general terms, is that the data in question was not SVP corrected after SBET computation and application to the data. Based on my technical review I would like the current remediation:

1. Pick one survey to serve as a representative example of this set. Save the current BASE surface with the SVP applied *before* SBET application as _OLD. Then, re-apply SVP and recompute a *new* grid. Do a difference surface and compute the min, max, average, and standard deviation for this difference surface.

   Based on my review the SBET process does no change the roll, pitch, or yaw nor the location of the transducer in the water column - or at least not in a meaningful way. This representative data set should confirm that.

2. Please report the finding of this analysis. Assuming it is exceedingly small, I think the next steps are:

   - Create a revised DAPR that can be used for all surveys that describes the problem and the analysis. I expect that you will work with AHB to arrange this documentation is properly included with all surveys.

   - I will provide a waiver in light of this analysis that authorizes the data to proceed using the current process.

   - Include both the waiver and this email in the separates for all theses surveys to document the action taken.

   - Ensure Hassler SOPs are updated to ensure this process is corrected.

3. If the analysis shows anything more than a 5cm difference, please advise me. We will discuss how to proceed from there.

It is my expectation that we will manage similar problems encountered with other field units or our contractors in a similar and consistent fashion. If there are any questions, concerns, or details I have not addressed I expect you or LCDR Welton will contact me with that information.

Rick

CAPT Rick Brennan, NOAA
Chief, Hydrographic Surveys Division
1315 East-West Highway, SSMC3 Room 6823
Silver Spring, MD 20910
Work: 301-713-2700
Cell: 443-994-3301

OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 10:36 AM
To: James J Miller <james.j.miller@noaa.gov>, Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>, Jonathan French - NOAA Federal <jonathan.r.french@noaa.gov>

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

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CO.Ferdinand Hassler - NOAA Service Account <co.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 10:53 AM
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>
Cc: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

CAPT,
Will do.

v/r
Matt

Lieutenant Commander Matthew Jaskoski, NOAA
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)
CO cell: (240) 687-4602
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OPS.Ferdinand Hassler - NOAA Service Account <ops.ferdinand.hassler@noaa.gov> Wed, Feb 15, 2017 at 3:26 PM
To: Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov>

FYI

Field Operations Officer, NOAA Ship *Ferdinand R. Hassler*
29 Wentworth Road
New Castle, NH, 03854

---------- Forwarded message ----------
From: **Richard Brennan - NOAA Federal** <richard.t.brennan@noaa.gov>
Date: Wed, Feb 15, 2017 at 10:11 AM
Subject: NOAA Ship Hassler SV Correct
To: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, CO HASSLER <CO.Ferdinand.Hassler@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

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CO.Ferdinand Hassler - NOAA Service Account <co.ferdinand.hassler@noaa.gov> Tue, Feb 21, 2017 at 12:55 PM
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>
Cc: Briana Welton <Briana.Welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

CAPT,
attached is our report of analysis of the two grids. The algorithm chose a couple different hypotheses around features and a slope area, but it appears that both grids are nearly identical. No change to VALSOU's etc.

v/r
Matt

Lieutenant Commander Matthew Jaskoski, NOAA
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H12932 Re-SVC Process Analysis.pptx
1988K

Briana Welton - NOAA Federal <briana.welton@noaa.gov> Wed, Mar 1, 2017 at 8:28 AM
To: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>
Cc: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Jaskoski and CAPT Brennan,

Based on the ship's analysis, I agree that reprocessing is unnecessary. I suggest that the ship accurately document how the data have been processed either in a revised DAPR or in the DR for each survey as deviation from the DAPR for all surveys still in the ship's control; and that AHB document how the data have been processed for the surveys that are in our control.

V/r,

Bri

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Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov> Thu, Mar 2, 2017 at 10:30 AM
To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>
Cc: "CO.Ferdinand Hassler - NOAA Service Account" <co.ferdinand.hassler@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

LCDR Welton,

I concur with your recommendations. Please proceed with this plan as you described.

LCDR Jaskoski,

Please work with AHB with regard to the best path regarding DAPR revision or documentation of this process in the DR.

Rick

CAPT Rick Brennan, NOAA
Chief, Hydrographic Surveys Division
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Silver Spring, MD 20910
Work: 301-713-2700
Cell: 443-994-3301

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CO.Ferdinand Hassler - NOAA Service Account <co.ferdinand.hassler@noaa.gov> Thu, Mar 2, 2017 at 10:39 AM
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>

Cc: Briana Welton - NOAA Federal <briana.welton@noaa.gov>, Benjamin K Evans <benjamin.k.evans@noaa.gov>, "OPS. Ferdinand Hassler" <OPS.Ferdinand.Hassler@noaa.gov>, Russell Quintero - NOAA Federal <Russell.Quintero@noaa.gov>, Samuel Greenaway - NOAA Service Account <Samuel.Greenaway@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>

Will do.

v/r
Matt

Lieutenant Commander Matthew Jaskoski, NOAA
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CO.Ferdinand Hassler - NOAA Service Account <co.ferdinand.hassler@noaa.gov> Thu, Mar 2, 2017 at 10:42 AM
To: Briana Welton - NOAA Federal <briana.welton@noaa.gov>
Cc: "OPS.Ferdinand Hassler" <ops.ferdinand.hassler@noaa.gov>

Hey Bri,
we've got these ready to go - might be able to submit them before we depart on Saturday, if not they'll be ready to go at our next inport (3/15-18)

Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Commanding Officer, NOAA Ship *Ferdinand R. Hassler* (S-250)
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APPROVAL PAGE

H12934

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- H12934_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12934_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531
Date: 2017.12.15 12:12:09 -05'00'

Approved:_____

Lieutenant Commander Briana Welton Hillstrom, NOAA
Chief, Atlantic Hydrographic Branch