H12961

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12961

LOCALITY

State(s):	Georgia & South Carolina
General Locality:	Approaches to Savannah
Sub-locality:	Northwest Savannah

2017

CHIEF OF PARTY
CDR Christiaan van Westendorp

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12961**

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):	**Georgia & South Carolina**
General Locality:	**Approaches to Savannah**
Sub-Locality:	**Northwest Savannah**
Scale:	**20000**
Dates of Survey:	**08/18/2017 to 09/14/2017**
Instructions Dated:	**03/22/2017**
Project Number:	**OPR-G329-TJ-17**
Field Unit:	**NOAA Ship *Thomas Jefferson***
Chief of Party:	**CDR Christiaan van Westendorp**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Side Scan Sonar & 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 H12961

Project: OPR-G329-TJ-17

Locality: Approaches to Savannah

Sublocality: Northwest Savannah

Scale: 1:20000

August 2017 - September 2017

NOAA Ship *Thomas Jefferson*

Chief of Party: CDR Christiaan van Westendorp

A. Area Surveyed

Survey H12961 was conducted for the Approaches to Savannah, GA in the vicinity of Tybee Roads Channel. Survey limits were acquired in accordance with the requirements set forth by the project instructions and the Hydrographic Surveys Specifications and Deliverables 2017 (HSSD) (Table 1 and Figure 1).

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
31° 59' 5.24" N 80° 44' 39.34" W	31° 55' 37.2" N 80° 36' 32.48" W

Table 1: Survey Limits

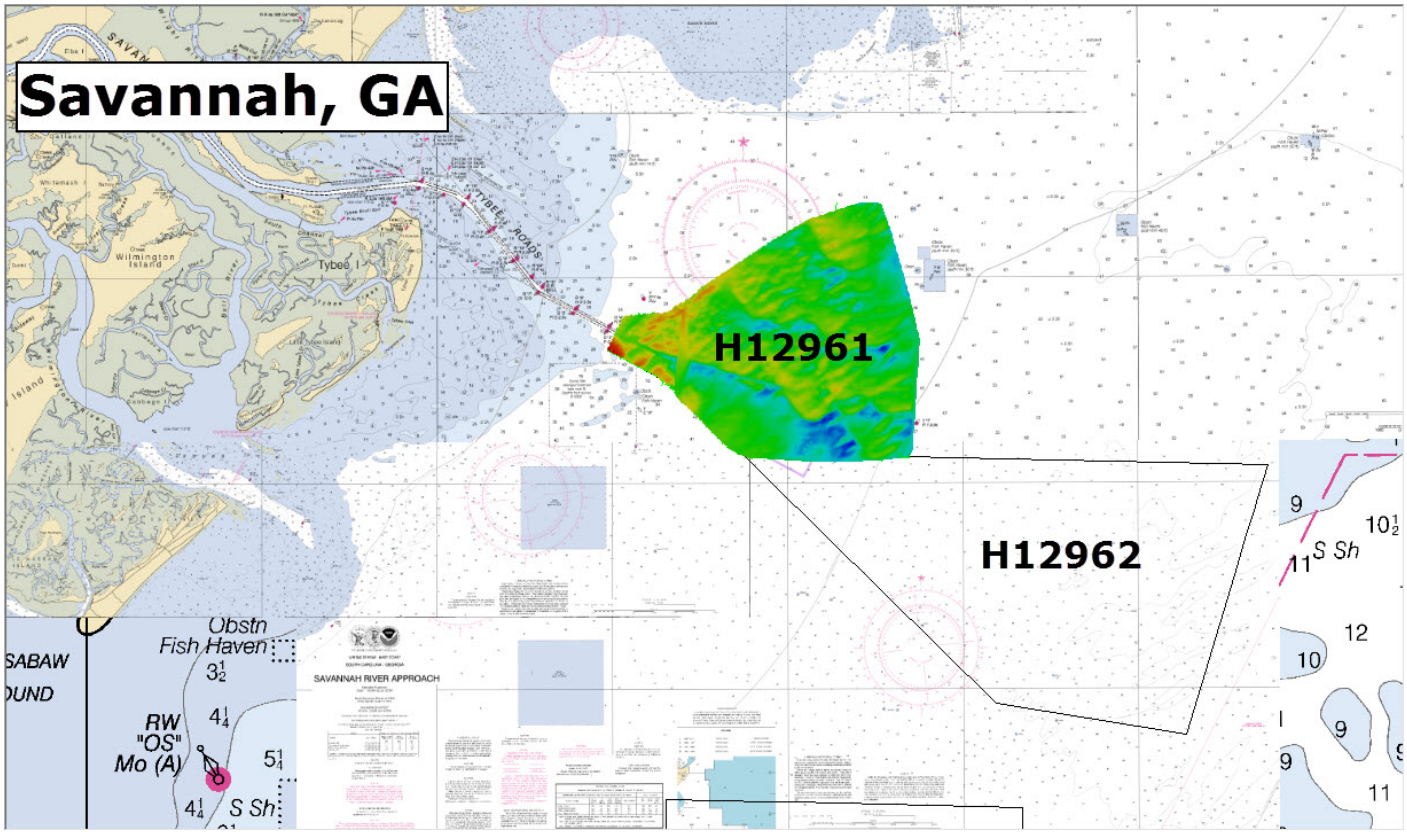


Figure 1: OPR-G329-TJ-17 Approaches to Savannah Survey H12961

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

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products in the approach to the Savannah Outer Harbor Channel. In order to allow deeper draft ships such as neo-panamax ships which could draft 39.5 feet, the Savannah Harbor channels are being deepened to 49 feet (at MLLW), with a controlling depth of 47 feet. The main driver for this project based on a request from the Savannah Pilots Association. The survey area is 181 square nautical miles and will also address concerns about migrating sand shoals.

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 (Table 2):

Water Depth	Coverage Required
0-20m	Object Detection Coverage accomplished using either: A) Object detection multibeam echosounder (ODMBES) depth and backscatter data, or B) 200% sidescan sonar (SSS) coverage with concurrent set line spacing singlebeam echosounder (SBES) depth data or ODMBES depth and backscatter data. Refer to section 5.2.2.2 of the HSSD 2017.

Table 2: Coverage Requirements

Survey coverage was in accordance with the requirements listed above and in the HSSD (Figure 2).

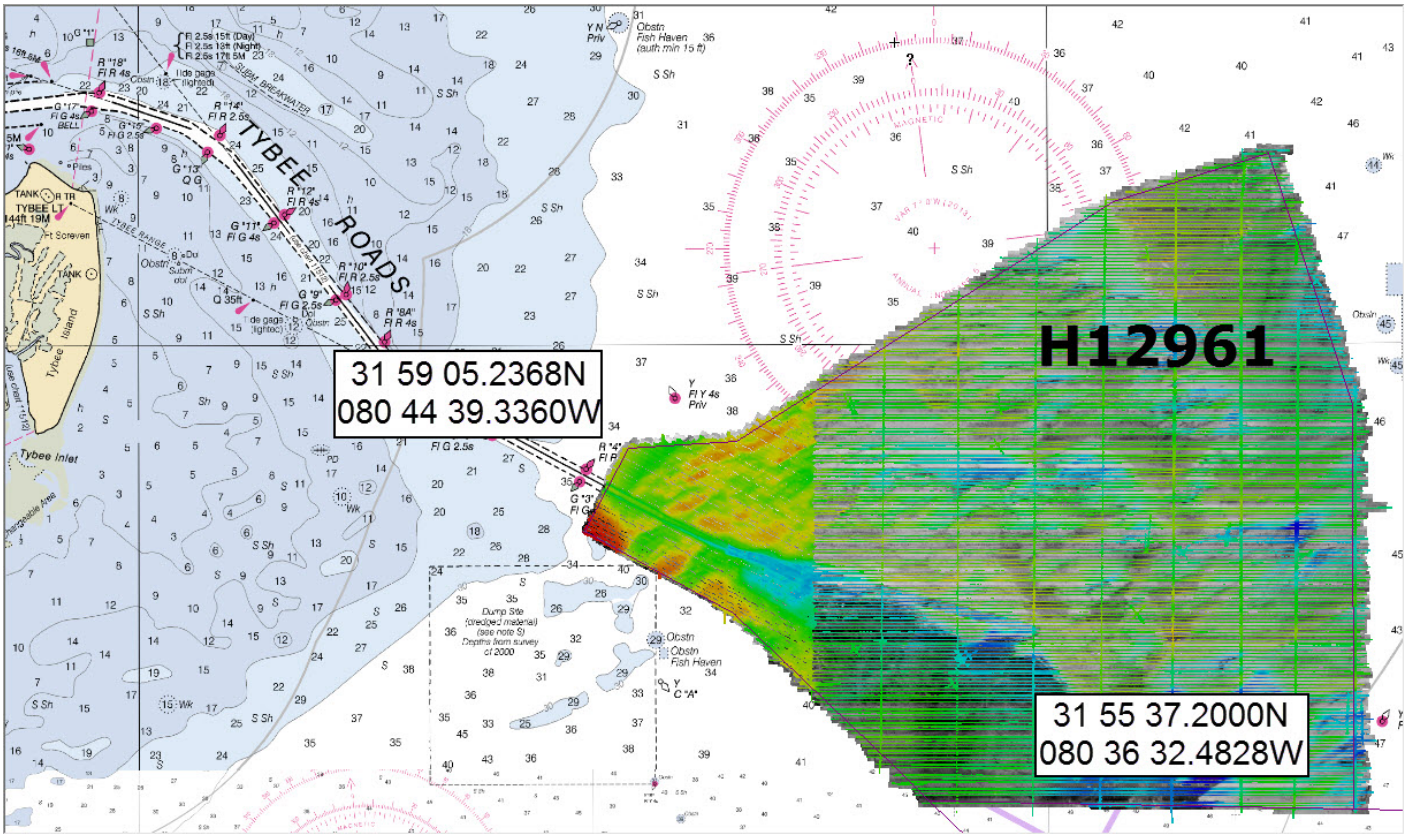


Figure 2: Survey H12961 Coverage: Object detection achieved via 200% SSS with concurrent ODMBES

A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey (Table 3):

	HULL ID	*S222*	*2903*	*Total*
LNM	**SBES Mainscheme**	0	0	0
	MBES Mainscheme	8.38	0.64	9.02
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	816.54	104.48	921.02
	SBES/MBES Crosslines	44.66	3.93	48.59
	Lidar Crosslines	0	0	0
Number of Bottom Samples				0
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				28

Table 3: Hydrographic Survey Statistics

The following table lists the specific dates of data acquisition for this survey (Table 4):

Survey Dates	Day of the Year
08/18/2017	230
08/19/2017	231
08/20/2017	232
08/21/2017	233
08/22/2017	234
08/23/2017	235
08/24/2017	236
08/25/2017	237
08/26/2017	238
08/30/2017	242
09/14/2017	257

Table 4: Dates of Hydrography

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 (Table 5):

Hull ID	*S222*	*2903*
LOA	208 feet	28 feet
Draft	15 feet	5 feet

Table 5: Vessels Used

Data were acquired by NOAA Ship *Thomas Jefferson* (S222) and Hydrographic Survey Launch (HSL) 2903. Both platforms acquired multibeam echo sounder (MBES) data, backscatter data, side scan sonar imagery, sound velocity profiles, surface sound velocity readings, and position and attitude data. Refer to Table 6 for specific manufacturer and model information pertaining to the primary acquisition systems used.

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM2040	MBES
RESON	7125 SV2	MBES
Klein	5000 V2	SSS
Klein	5000 V1	SSS
Applanix	POSMV 5	Positioning and Attitude System
Brooke Ocean Technology	MVP100	Sound Speed System
SBE	19+	Conductivity, Temperature, and Depth Sensor
RESON	SV71	Sound Speed System
Valeport	Thru Hull SVS	Sound Speed System

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

MBES crosslines acquired for this survey totaled 5.22% of mainscheme acquisition.

A total of 921.02 linear nautical miles (LNM) of SSS data with concurrent MBES were acquired with an additional 9.02 LNM of MBES developments within the sheet limits of survey H12961. A total of 48.59 miles of MBES crosslines were acquired within the sheet limits of H12961. A 50cm resolution surface was created for both the mainscheme MBES data and MBES crossline data respectively. Differencing the two surfaces produced a mean difference of 0.09m with a standard deviation of 0.13m. 4,839,070 of 4,840,322 (99.9%) soundings compared are within 50cm of agreement. Survey H12961 complies with section 5.2.4.3 of the HSSD.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey (Tables 7 and 8):

Method	Measured	Zoning
Discrete Zoning	0 meters	0.2 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	N/A meters/second	2 meters/second	0.5 meters/second
2903	2 meters/second	N/A meters/second	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

For the surface H12961_MB_50cm_MLLW_Final 172,868,532 nodes were evaluated and 172,867,283 (99.9%) were within acceptable IHO order one uncertainty standards (Figure 3). The majority of nodes that exceed IHO order one uncertainty standards are located along the outer beams of HSL 2903 data; the remaining incidents are located on features (Figure 4). Refer to the DAPR for ship specific uncertainty calculation standards and procedures.

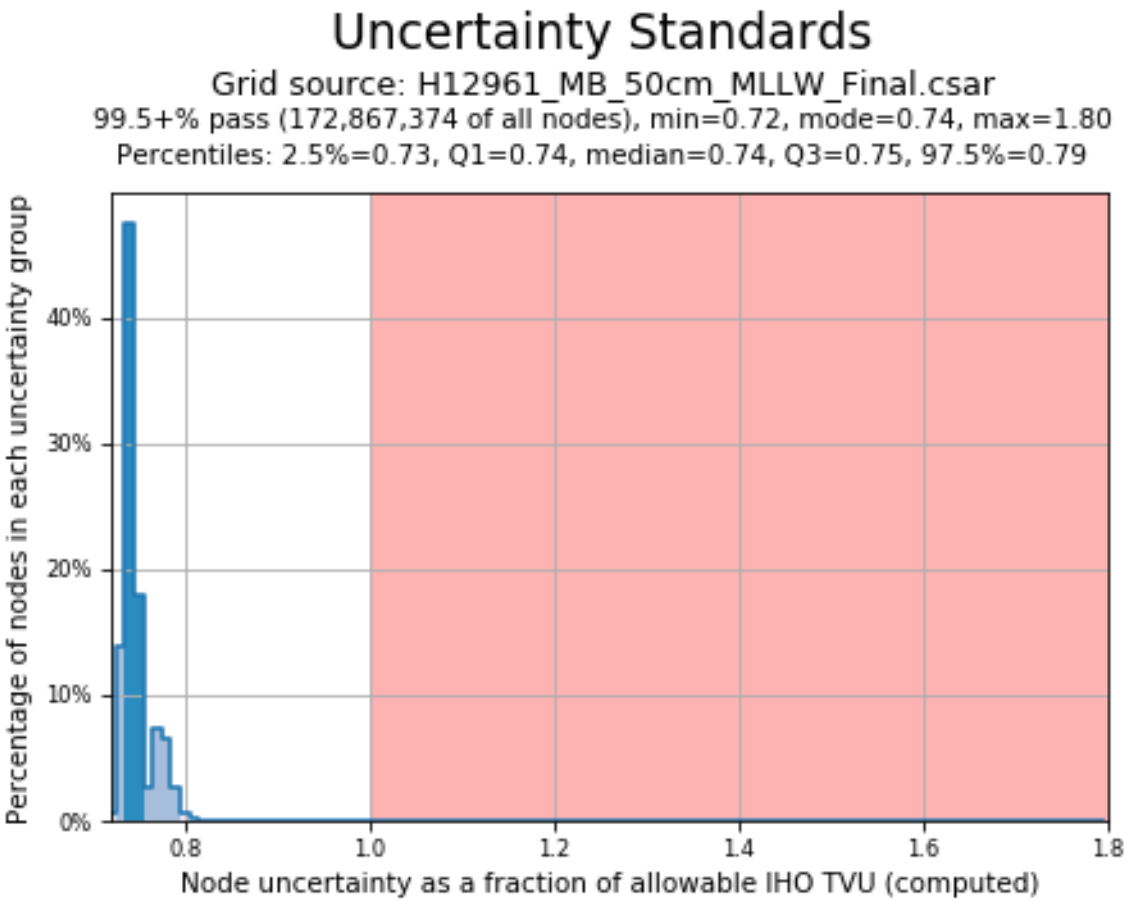


Figure 3: IHO Order 1 Uncertainty Standards

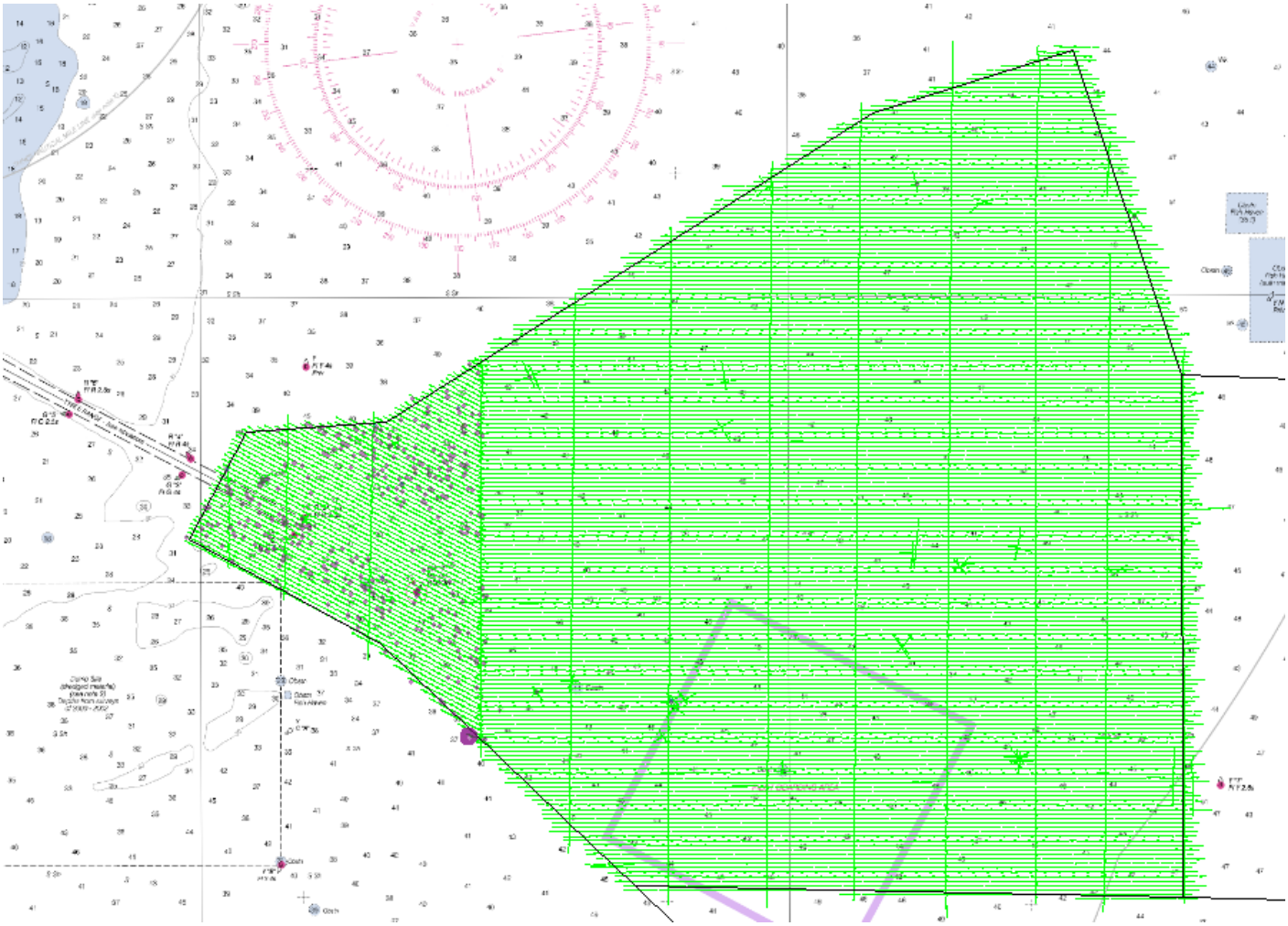


Figure 4: Physical distribution of H12961 MBES surface nodes which exceed IHO Order 1 tolerance

B.2.3 Junctions

Two contemporary junction surveys exist adjacent to survey H12961: H12962 (*Thomas Jefferson* 2017) and H12960 (*Thomas Jefferson* 2016) (Figure 5 and Table 9).

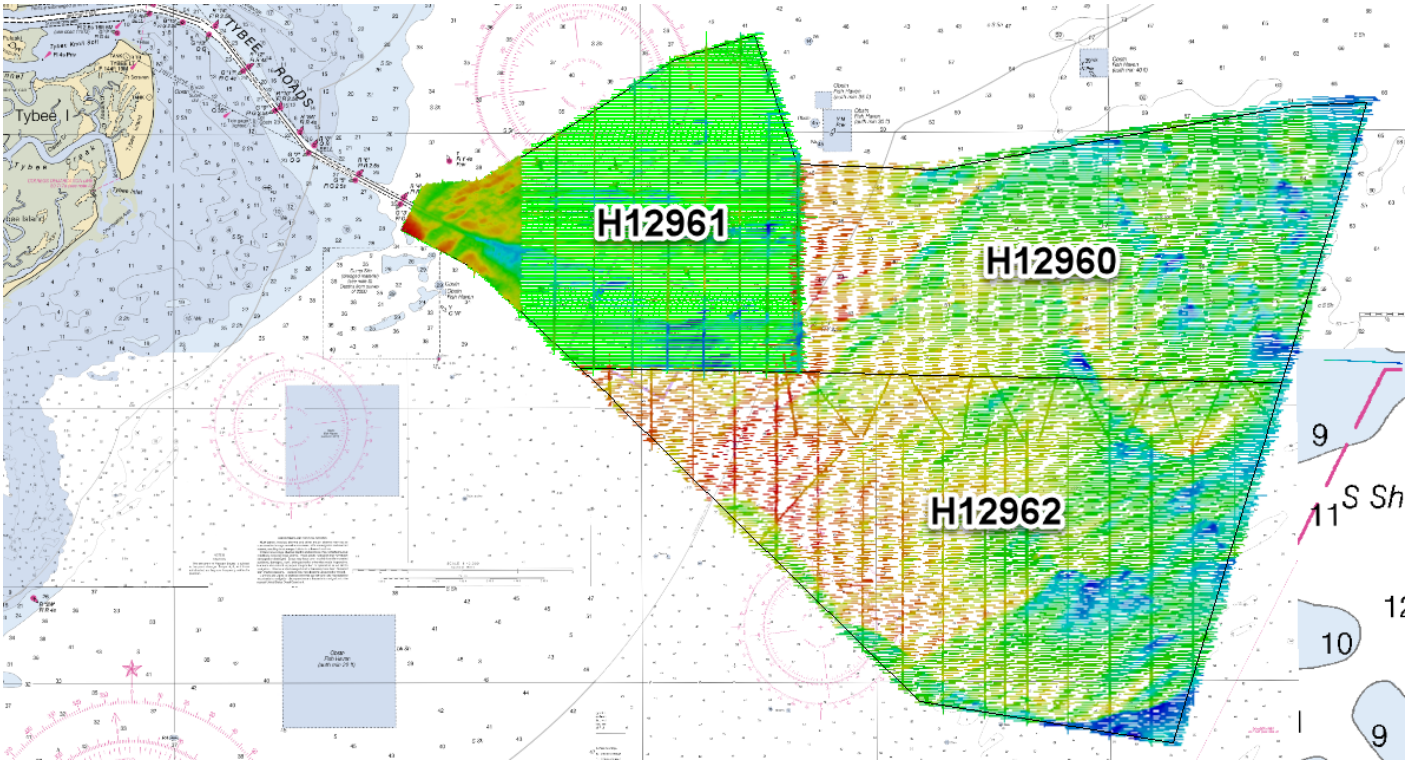


Figure 5: Junction surveys to H12961

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12960	1:20000	2016	NOAA Ship *THOMAS JEFFERSON*	E
H12962	1:20000	2017	NOAA Ship *THOMAS JEFFERSON*	S

Table 9: Junctioning Surveys

H12960

The difference between survey H12961 and H12960 ranged from –0.73m to 0.61m. The mean difference was -0.04m, with a standard deviation of 0.14m. Of 1,612,416 intersecting nodes 1,612,410 (99.9%) were within 50cm.

H12962

The difference between survey H12961 and preliminary data from survey H12962 ranged from –0.51m to 0.57m. The mean difference was 0.079m, with a standard deviation of 0.15m. Of 855,362 intersecting nodes 854,756 (99.9%) were within 50cm.

B.2.4 Sonar QC Checks

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

During acquisition of survey H12961, a consistent 0.2m offset between MBES data acquired by HSL 2903 and S222 was noted. A reference surface comparison was conducted between HSL 2903 and S222 MBES bathymetry. The resulting bathymetric surfaces showed a mean difference of 0.21m. The Operations Officer and an augmenting Physical Scientist reviewed HIPs Vessel Files for both vessels, finding no outstanding issues. See "Reference Surface Post Acquisition" in Appendix II of this report for further information.

B.2.5 Equipment Effectiveness

Applanix POS MV Installation Parameters

After acquisition of H12961, further investigations into the vertical offset between HSL data and S222 MBES data were conducted. It was discovered that the lever-arm offset values between GNSS receiver and IMU of HSL 2903 had not been updated to reflect the official survey values of the new vessel, but were still using values from the outdated survey vessel 3101. The vertical difference between the GNSS receiver and IMU for HSL 2903 to HSL 3101 was calculated to be approximately 0.23m.

A similar issue of incorrect offset values existed with S222, to a lesser degree. The vertical lever-arm installation value for the ship was found to be inaccurate by approximately 0.08m, as the measurement was initially recorded to the base of the GNSS antennae not the true phase center.

HSD was notified of these discoveries, and further information can be found in Appendix II of this report (3 email chains containing "Vertical Offset" in the title).

B.2.6 Factors Affecting Soundings

HSL Multibeam Data Quality Issues

The *Thomas Jefferson* acquired the westernmost section of Survey H12961 with HSL 2903. This vessel uses a Klein 5000 lightweight SSS which acts as master to the Reson SV2 7125 MBES when pinging

concurrently, preventing frequency interference. In this installation configuration the ping rate of the MBES is controlled by the ping rate of the SSS, greatly reducing along track density of MBES data.

The sea state was unfavorable during the majority of HSL 2903 data acquisition, as evidenced by across-swath data gaps throughout the western section of the finalized MBES surface. To ensure MBES data met HSSD requirements a 50cm, HSL-only surface was created in Caris and analyzed in PydroXL QC Tools: 97% of nodes pass ODMBES density standards, meeting HSSD requirements.

The final challenge faced on HSL 2903 is the new configuration of wet-end sonar equipment. The SSS is hull-mounted on the starboard side of the vessel and hangs low enough to be physically detected by the MBES, creating false sounding returns. To compensate, a Caris swath editor filter was applied to beams 400-512. Additional soundings were rejected as necessary in Caris subset editor where vessel motion caused false sounding returns to occur closer to nadir than beam 400.

B.2.7 Sound Speed Methods

Moving vessel profile casts were acquired every 20 to 30 minutes from the *Thomas Jefferson*, and CTD casts were acquired every 2-3 hours from HSL 2903. All casts acquired are within the assigned sheet limit and meet requirements outlines in section 5.2.3.3 of the HSSD (Figure 6).

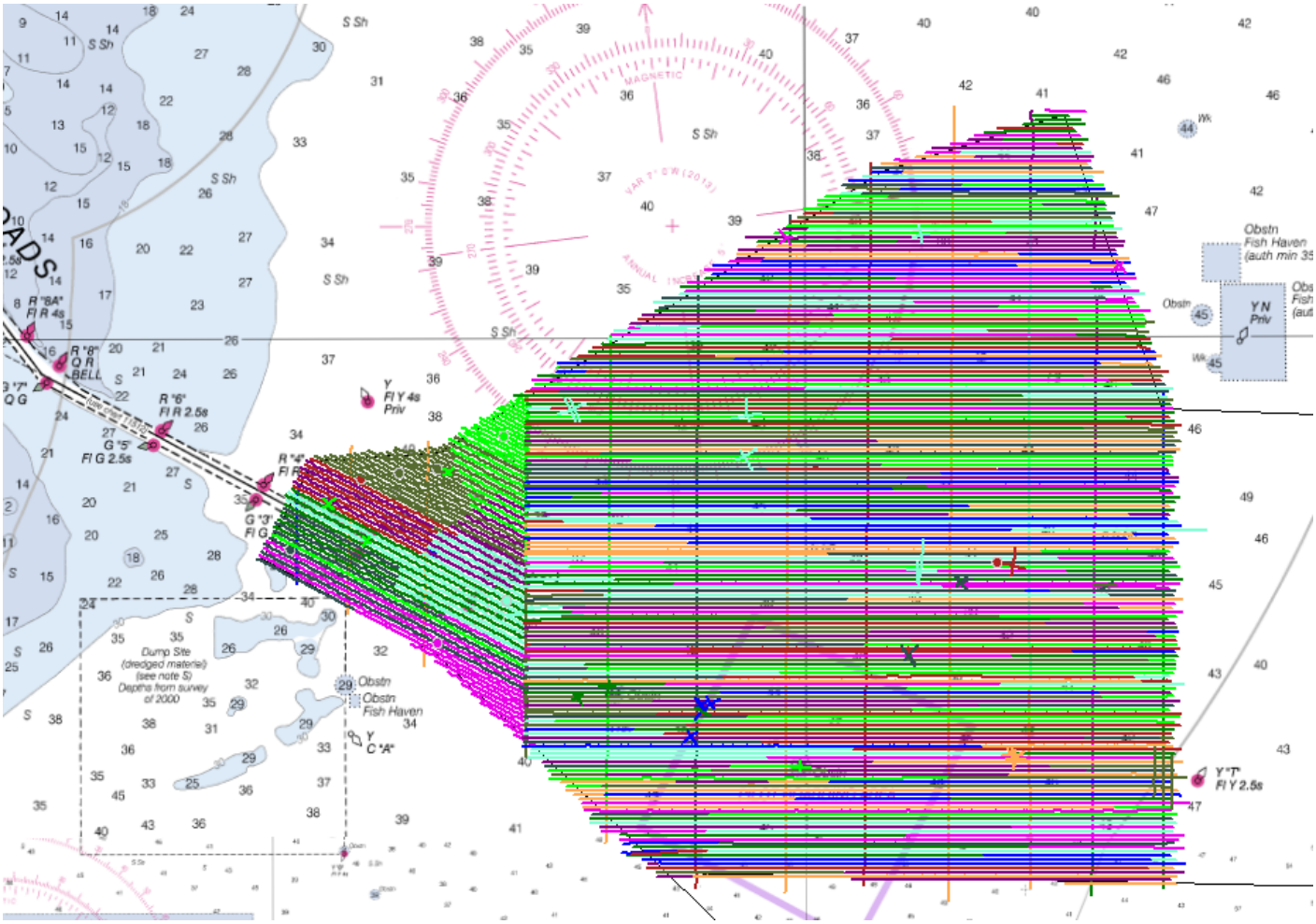


Figure 6: Sound speed profile distribution of survey H12961

B.2.8 Coverage Equipment and Methods

Refer to the DAPR and sections A.4 and B.1.1 of this report for survey equipment and methods used to meet coverage requirements for this project.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

Survey H12961 is reduced to MLLW via discrete tide application. Reduction to MLLW via VDatum was attempted, but induced vertical offsets that exceeded HSSD and IHO allowances. Refer to section B.2.5 of this report for further information.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Raw Backscatter was logged as a 7k file and was processed by the field unit per the DAPR. Backscatter geotiffs have been submitted to the Processing Branch.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing (Table 10):

Manufacturer	Name	Version
CARIS	HIPS	10.3

Table 10: Primary bathymetric data processing software

The following software programs were the primary programs used for imagery data processing (Tables 11 and 12):

Manufacturer	Name	Version
CARIS	SIPS	10.3

Table 11: Primary SSS imagery data processing software

Manufacturer	Name	Version
QPS	FMGT	7.4

Table 12: Primary backscatter imagery data processing software

The following Feature Object Catalog was used: NOAA Profile V_5_6.

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
H12961_MB_50cm_MLLW	CUBE	50 centimeters	9.06 meters - 17.83 meters	NOAA_0.5m	Object Detection
H12961_MB_50cm_MLLW_FINAL	CUBE	50 centimeters	9.06 meters - 17.83 meters	NOAA_0.5m	Object Detection
H12961_SSS_100	SSS Mosaic	1 meters	-	N/A	100% SSS
H12961_SSS_200	SSS Mosaic	1 meters	-	N/A	200% SSS

Table 12: Submitted Surfaces

The submitted 50cm surface for H12961 meets density requirements for ODMBES as described in section 5.2.2.2 of the HSSD (Figure 7). For requirement reference, see section A.4 of this report.

Pydro QC Tools Flier Finder was used to scan the finalized multibeam surface for potential false surface nodes. When fliers greater than 50cm are identified, a total of 5 nodes are flagged. Three of the five are over two channel marker buoy blocks: RW"T" (2 "fliers") and R"2" (1 "flier"). The remaining two are real features (Figure 8). See the final feature file submitted with this report for further details.

Two SSS holidays exist within the sheet limits of survey H12961. Both data gaps occur in the 100% SSS mosaic. The first occurs in the vicinity of 32.017252N 080.66359W, and the other around 31.999791N 080.695001W. Both data gaps occur along the northwest edge of the assigned sheet limit, and both have compensating coverage in the 200% SSS mosaic. The second 100% SSS covers these data gaps, coupled with ODMBES. No significant features were detected.

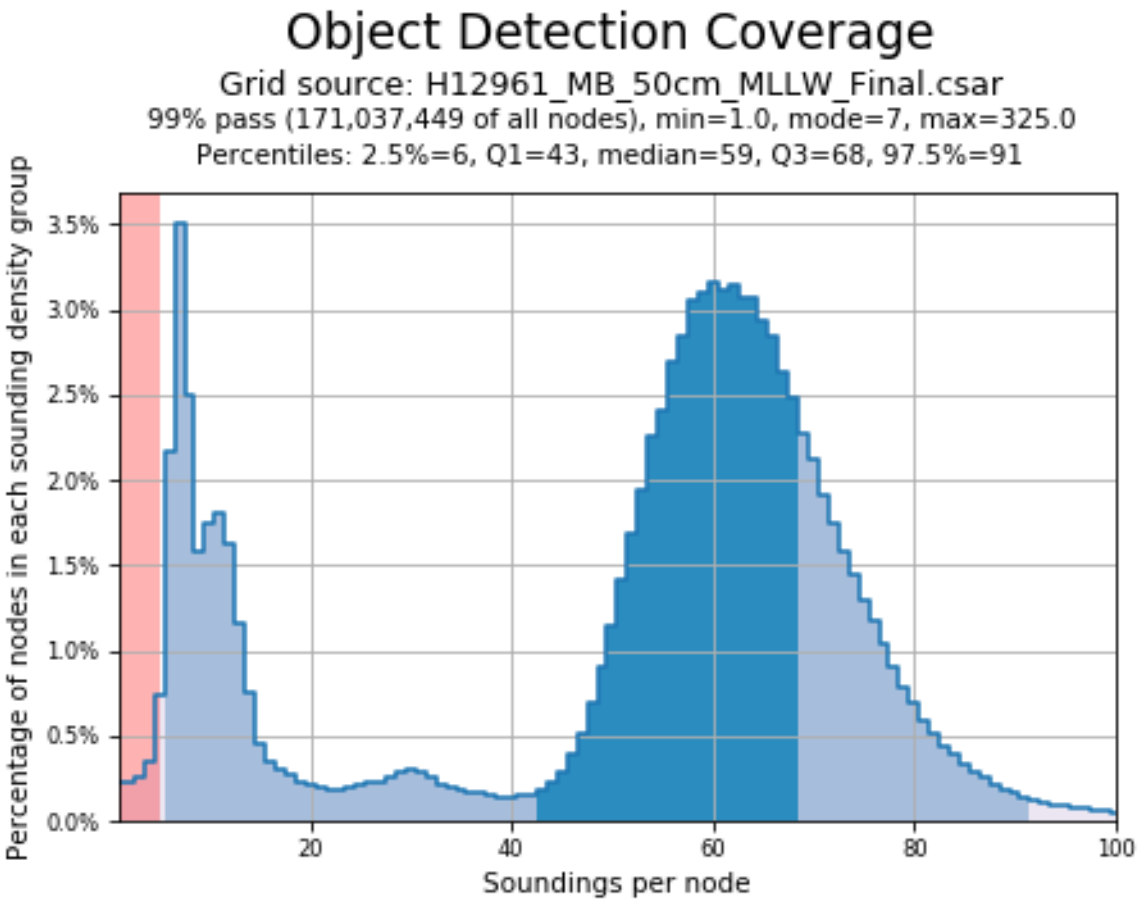


Figure 7: Survey H12961 Object Detection Density Statistics

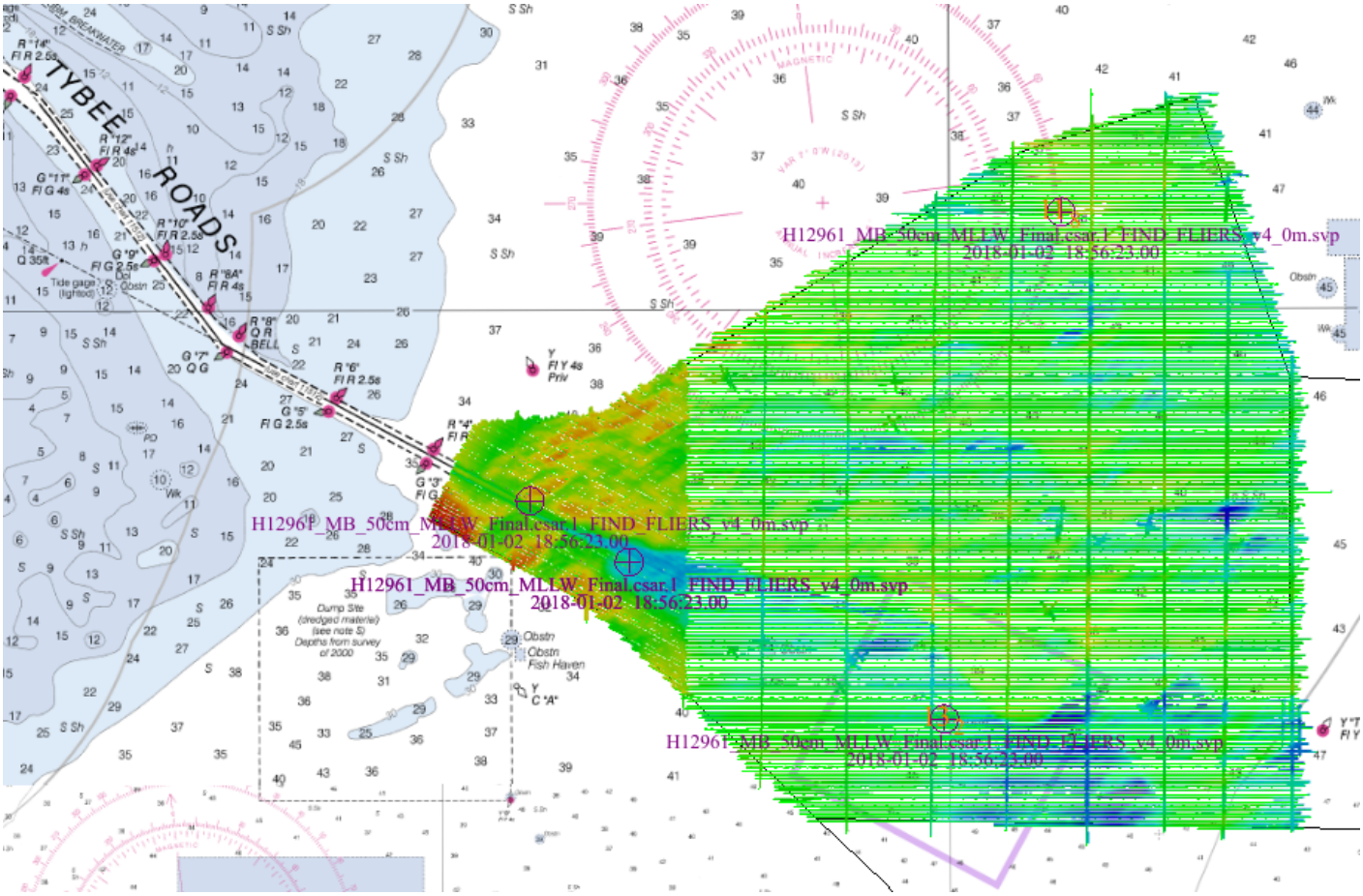


Figure 8: Surface nodes flagged by Pydro XL Flier Finder

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying Horizontal and Vertical Control Report (HVCR). Survey H12961 deviates from the HVCR submitted in this report in that the data are vertically reduced to MLLW via the application of discrete tides.

C.1 Vertical Control

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

Traditional Methods Used:

Discrete Zoning

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey (Tables 14-16):

Station Name	Station ID
Fort Pulaski	8670870

Table 14: NWLON Tide Stations

File Name	Status
8670870.tid	Final Approved

Table 15: Water Level Files (.tid)

File Name	Status
G329TJ2017CORP.zdf	Final

Table 16: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS3 on 10/07/2017. The final tide note was received on 10/20/2017.

C.2 Horizontal Control

The horizontal datum for this project is WGS 1984.

The projection used for this project is UTM 17N.

The following PPK methods were used for horizontal control:

Launch 2903 positioning correctors were created using traditional smartbase IAPPK post-processing methods in POSPac MMS 8.1 and applied to data in Caris 10.3.

The following PPP methods were used for horizontal control:

NOAA Ship *Thomas Jefferson* positioning correctors were created using post-processed precise point positioning methods in POSPac MMS 8.1 and applied to data in Caris 10.3. An error occurred in the positioning data of day number 232_AM, which prevents the SBET and RMS from being applied to the

data. The missing post-processed positioning data caused no appreciable difference in the final appearance or statistics of the final surface submitted with this survey.

C.3 Additional Horizontal or Vertical Control Issues

C.3.1 POS MV Installation Parameter Errors

Refer to section B.2.5 of this report.

D. Results and Recommendations

D.1 Chart Comparison

A chart comparison was conducted between survey H12961 soundings and previously charted ENC soundings using both Chart Review and DtoN Scanner tools embedded within Pydro QC Tools v.1.9.7.

D.1.1 Electronic Navigational Charts

The following is the largest scale ENC, which covers the survey area (Table 17):

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5GA20M	1:40000	44	10/24/2017	10/24/2017	NO

Table 17: Largest Scale ENC

US5GA20M

A shoal sounding comparison reveals that soundings from Survey H12961 generally agree within 1m of charted soundings. (Figure 9). The maximum difference between new-to-existing soundings is found in the vicinity of 31.972661N 080.655367W with a difference value of approximately 1m. (Figures 10 and 11). Moderate shoaling is also present within the extents of Tybee Range (Figure 12).

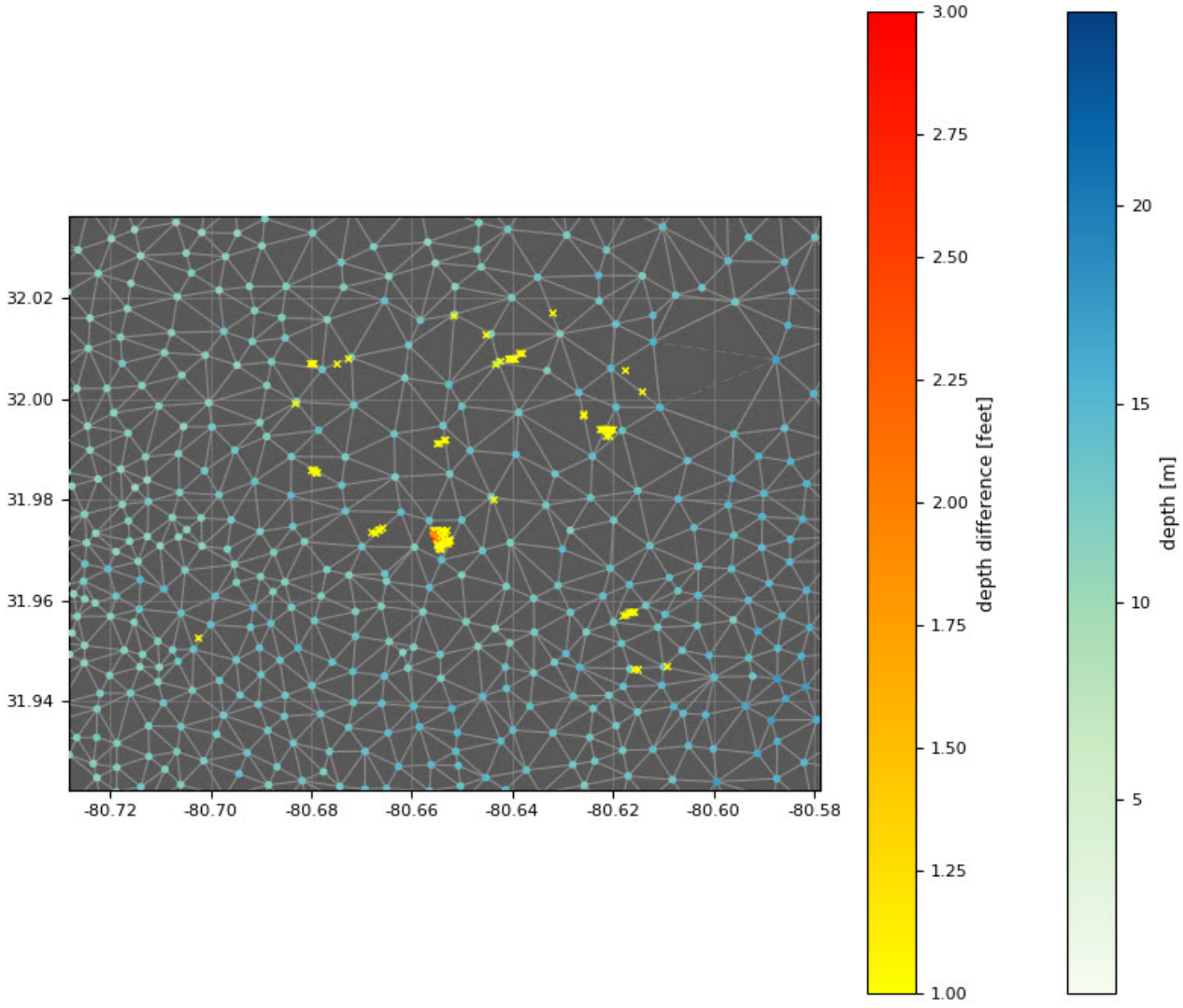


Figure 9: Scaled comparison of surveyed soundings to charted soundings

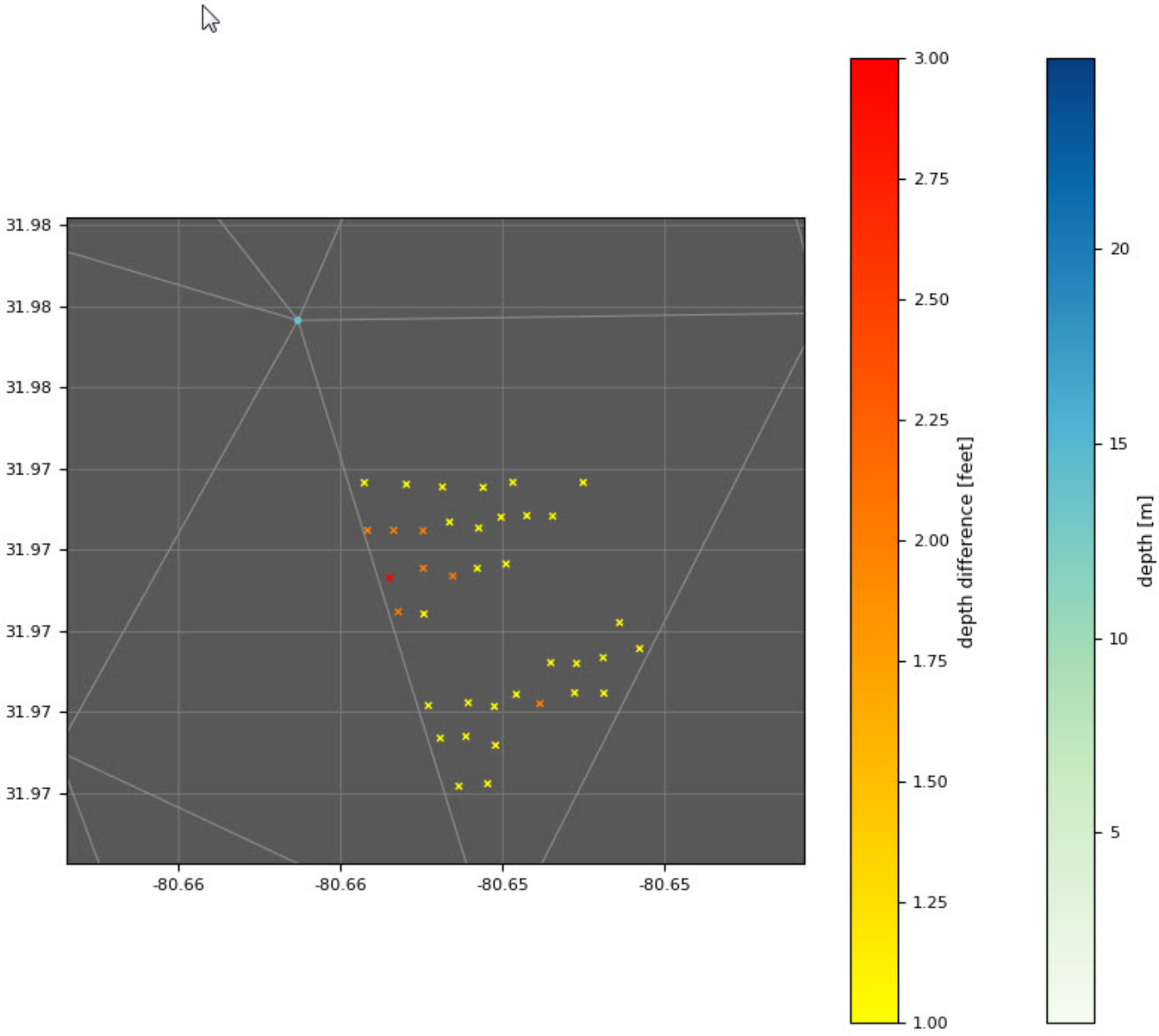


Figure 10: Area of greatest difference of surveyed soundings to charted soundings in the vicinity of 31.972661N 080.655367W (near center of survey area)

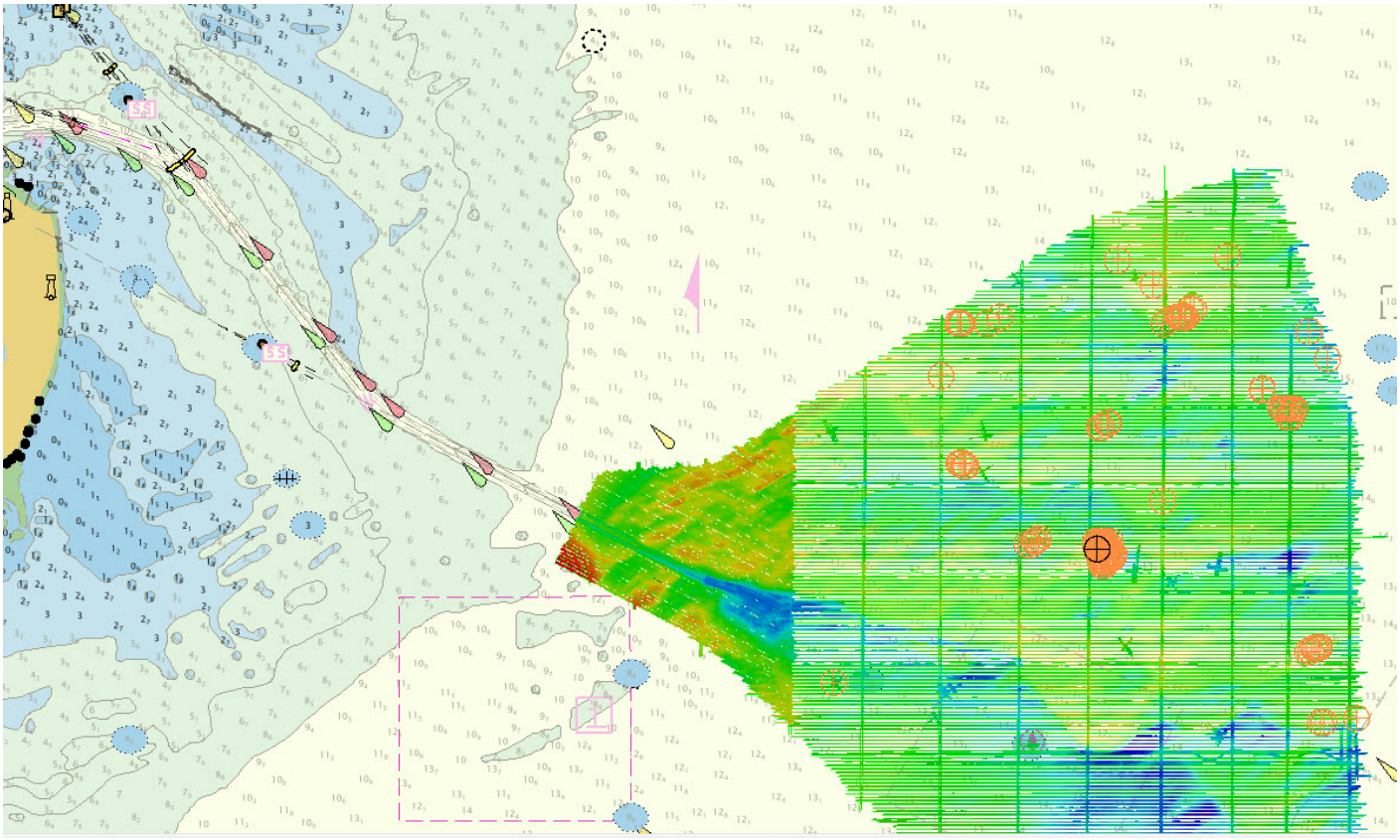


Figure 11: Black cartographic symbol represents surveyed sounding of greatest difference to charted soundings in the vicinity of 31.972661N 080.655367W (near center of survey area)

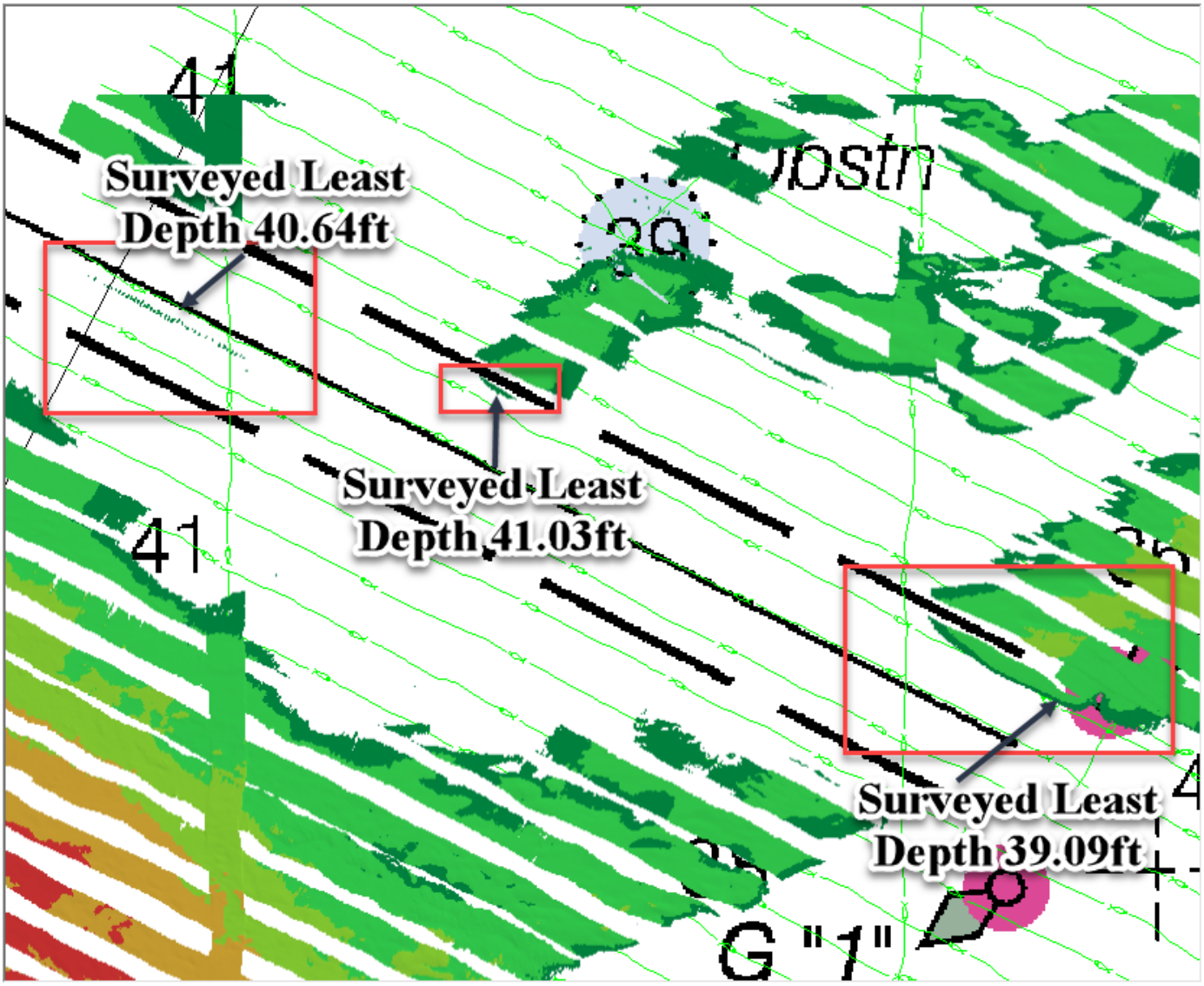


Figure 12: Instances of shoaling in Tybee Range

D.1.2 Maritime Boundary Points

No maritime boundary points were assigned for this survey.

D.1.3 Charted Features

Survey H12961 contained a total of 4 assigned obstructions and 3 aids to navigation. For a full discussion, refer to the final feature file submitted with this report.

D.1.4 Uncharted Features

One previously uncharted obstruction was located in the vicinity of 32.013664N 080.648200W via 200% SSS, and investigated using ODMBES For a full discussion, refer to the final feature file submitted with this report.

D.1.5 Shoal and Hazardous Features

General areas of moderate shoaling exist for survey H12961 from the middle of the survey area extending North and East to the sheet limits. No areas exhibit greater than 1m difference to charted soundings. Refer to Figure 11 in section D.1.1 of this report.

D.1.6 Channels

Survey H12961 encompasses the seaward section of the Tybee Range Channel on the approach to Savannah, GA. Currently, the United States Army Corps of Engineers (USACE) is working to expand and deepen the channel to allow neo-panamax cargo ships into the Port of Savannah. Dredging operations were ongoing at the time of this survey.

The alongshore current in this region runs North to South causing general sediment movement in the same direction. Survey H12961 shows moderate shoaling along both the North edge and middle of the project channel. Refer to Figure 12 section D.1.1 of this report for further information.

D.1.7 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

Shoreline was not assigned for this survey.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Three lighted aids to navigation are located with the limits of survey H12961: G"1", R"2", and RW"T". At the time of this survey all aids to navigation were on station and operating as intended.

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 Platforms

No platforms exist for this survey.

D.2.7 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.8 Abnormal Seafloor and/or Environmental Conditions

No abnormal seafloor and/or environmental conditions exist for this survey.

D.2.9 Construction and Dredging

Ongoing USACE dredging operations exist within the survey limits. Shoaling outside of acceptable limits of tabulated depths occurs within the channel. Refer to section D.1.1 of this report.

D.2.10 New Survey Recommendation

Upon completion of channel expansion and dredging operations the chart should be updated to reflect the controlling depths of the new channel.

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
CDR Christiaan van Westendorp, NOAA	Commanding Officer	01/18/2018	VAN WESTENDORP.CHRISTIAAN.HENRY.1012828175 c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=VAN WESTENDORP.CHRISTIAAN.HENRY.1012828175 2018.01.18 16:36:31 -05'00'
LT Anthony Klemm, NOAA	Field Operations Officer	01/18/2018	KLEMM.ANTHONY ROSS.1392701601 Digitally signed by KLEMM.ANTHONY.ROSS.1392701601 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=KLEMM.ANTHONY.ROSS.1392701601 Date: 2018.01.18 15:13:15 -05'00'
Allison C. Stone	Sheet Manager	01/18/2018	AllisonCStone

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	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
PRF	Project Reference File

Acronym	Definition
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

Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>

Final Tide Note for OPR-G329-TJ-2017, H12961

Alison Carisio - NOAA Affiliate <alison.carisio@noaa.gov> Fri, Oct 20, 2017 at 3:19 PM
To: CO.Thomas.Jefferson@noaa.gov, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Thomas.Jefferson.Tides@noaa.gov
Cc: "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, Gerald Hovis - NOAA Federal <gerald.hovis@noaa.gov>, Corey Allen <corey.allen@noaa.gov>, Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>, Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>

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

DATE: 10/20/2017

MEMORANDUM FOR: CDR Christiaan Van Westendorp
Commanding Officer, NOAA Ship Thomas Jefferson

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

SUBJECT: Delivery of Tide Requirements for Hydrographic Surveys

This is notification that the preliminary zoning is accepted as the final zoning for survey project OPR-G329-TJ-2017, H12961 during the time periods of August 18 - 26, August 30, and September 14, 2017. The accepted reference station for Registry No. H12961 is Fort Pulaski, GA (8670870).

Included with this memo is the Tide Note in .PDF format, stating the preliminary zoning has been accepted as the final zoning.

--
Alison Carisio
Technical Specialist III - LynkerTech
NOAA/NOS/CO-OPS
SSMC IV, Station 7135
1305 East-West Highway
Silver Spring, MD 20910-3282
240-533-0611

H12961.pdf
1655K

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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 20, 2017

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-G329-TJ-2017
HYDROGRAPHIC SHEET: H12961
LOCALITY: Northwest Savannah, Approaches to Savannah, GA
TIME PERIOD: August 18 - 26, August 30, September 14, 2017

TIDE STATION USED: 867-0870 Fort Pulaski, GA
Lat. 32° 2.2' N Long. 80° 54.1' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.173 meters

REMARKS: RECOMMENDED ZONING Preliminary zoning is accepted as the final zoning for project OPR-G329-TJ-2017, H12961, during the time periods of August 18 - 26, August 30, and September 14, 2017.

Please use the zoning file G329TJ2017CORP submitted with the project instructions for OPR-G329-TJ-2017. Zones SA172D, SA172C, and SA172B are the applicable zones for H12961.

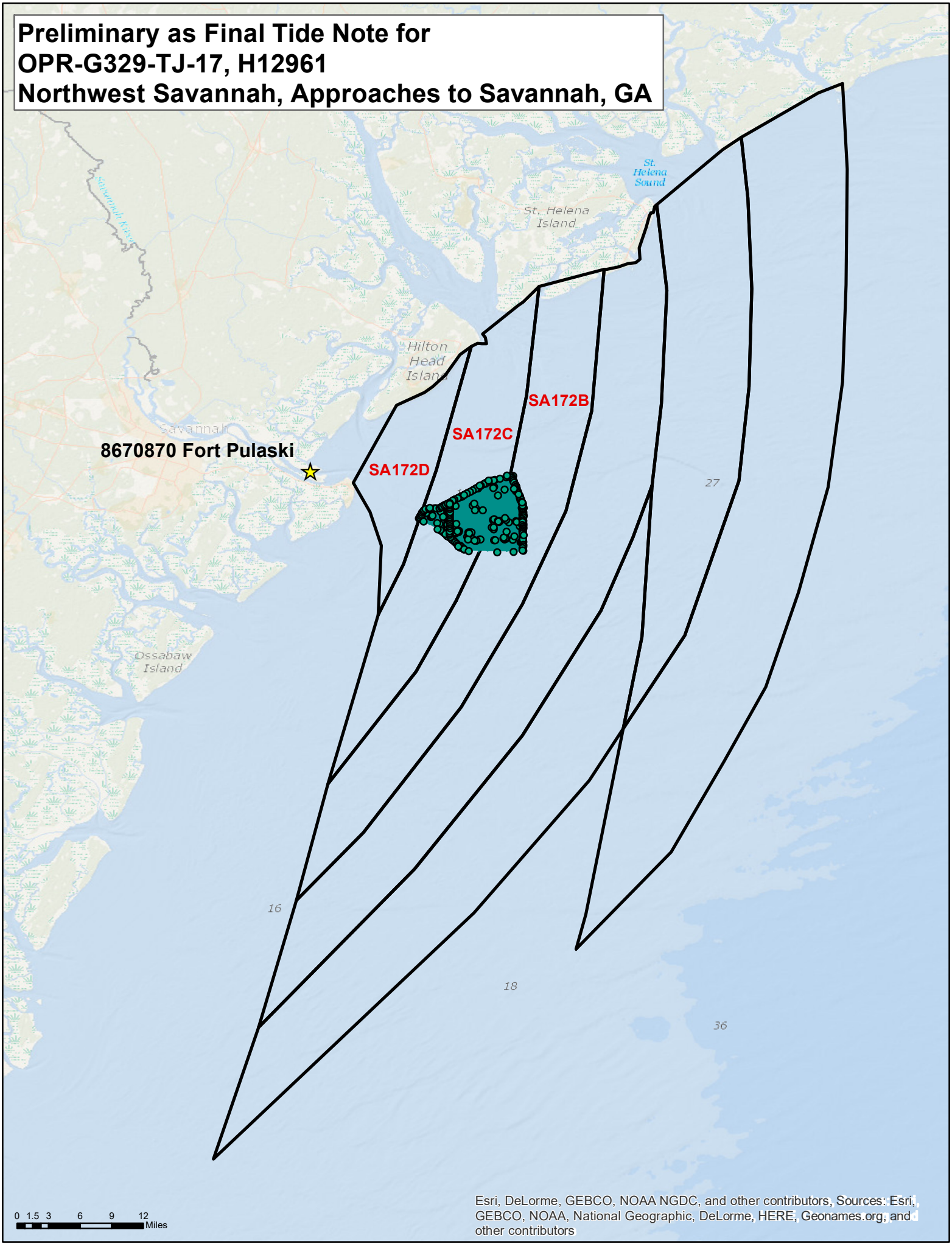
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: Annual leveling for Fort Pulaski, GA (8670870) was not completed in FY17. A review of the verified leveling records from October 2007 - 2017 shows the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for survey OPR-G329-TJ-2017, H12961. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

_____
CHIEF, PRODUCTS AND SERVICES BRANCH

Preliminary as Final Tide Note for
OPR-G329-TJ-17, H12961
Northwest Savannah, Approaches to Savannah, GA



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

Fwd: Thomas Jefferson 2017 NODC Files

2 messages

Tracy McMillan - NOAA Federal <tracy.mcmillan@noaa.gov> Tue, Jan 23, 2018 at 12:46 PM
To: Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>, Allison Stone - NOAA Federal <allison.c.stone@noaa.gov>, "ChiefST.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>

I apologize for not sending this Friday. I didn't see your email until I had already left for the day. H12961 and H12962 didn't have any issues to correct so I assume they were added to the database already. I will work on the issues found with the other sheets from the season after our content review. Again, I'm sorry for the delay.

Tracy

---------- Forwarded message ----------
From: **Tracy McMillan - NOAA Federal** <tracy.mcmillan@noaa.gov>
Date: Tue, Jan 2, 2018 at 8:29 AM
Subject: Thomas Jefferson 2017 NODC Files
To: "NODC.Submissions" <nodc.submissions@noaa.gov>
Cc: Sam Greenaway <Samuel.Greenaway@noaa.gov>

Attached are all the NODC files from the Thomas Jefferson for the 2017 Field season.

Please let me know if there are any issues.

Thank you,

Tracy McMillan
tracy.mcmillan@noaa.gov

NODC_2017.zip
4039K

Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov> Tue, Jan 23, 2018 at 12:59 PM
To: Tracy McMillan - NOAA Federal <tracy.mcmillan@noaa.gov>

Tracy,

Perfect. Thanks for forwarding this on.

Best,
Anthony

LT Anthony Klemm, NOAA
Field Operations Officer
NOAA Ship *Thomas Jefferson*
439 W York Street
Norfolk, VA 23510
757-647-0187

Learn about NOAA nautical charts - www.nauticalcharts.noaa.gov
[Quoted text hidden]

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations,
Marine Operation Center-Atlantic, NOAA Ship Thomas Jefferson
Norfolk, Virginia 23510

July 7, 2017

MEMORANDUM FOR: Jay Nunenkamp
Environmental Compliance Coordinator, NOAA Office of Coast Survey

FROM: ENS Jacquelyn Putnam, NOAA
Junior Officer, NOAA Ship *Thomas Jefferson*

SUBJECT: Marine Species Trained Observers

The following personnel completed the required Marine Species Awareness Training (MSAT) on June 30, 2017:

- LCDR Olivia Hauser
- LT Matthew Forrest
- LT Anthony Klemm
- ENS Max Andersen
- ENS Dale Gump
- ENS Sydney Catoire
- ENS Garrison Grant
- ENS Jacquelyn Putnam
- 2AE Stephen Williams
- 2AE William Osborn
- 3AE Otis Tate
- JUE Sharon Gilliam
- EU Andy Medina
- WP Michael Wilson
- ET Thomas Loftin
- ET Michael Peperato
- HSST Allison Stone
- HST Kim Glomb
- HAST Joshua Hiteshew
- HAST Tracey McMillan
- CB Bernard Pooser
- BGL Robert Bayliss

- SS Francine Grains
- SS James Brzostek
- AB Patrick Osborn
- AB Thomas Bascom
- GVA Joshua Thompson
- CS David Fare
- CC Ace Burke
- 2C Nester Poblete

Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>

Coast Pilot Review

1 message

Joshua Hiteshew - NOAA Federal <joshua.hiteshew@noaa.gov> Wed, Jan 31, 2018 at 8:09 AM
To: OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov>, _NOS OCS NSD Coast Pilot <coast.pilot@noaa.gov>
Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, _OMAO MOA ChiefST Thomas Jefferson <chiefst.thomas.jefferson@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>

To whom it may concern,

Attached is the Coast Pilot review for project OPR-G329-TJ-17.

V/r,

Josh
--
HST Joshua Hiteshew, NOAA
NOAA ship Thomas Jefferson
439 W York St, Norfolk, VA 23510

OPR-G329-TJ-17_Coast Pilot Review Report.pdf
464K

Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>

H12961 submission extension request (1 week)

2 messages

CO Thomas Jefferson <co.thomas.jefferson@noaa.gov> Mon, Jan 8, 2018 at 11:11 AM
To: Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>
Cc: Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "chiefst.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>

CAPT,

Due to a host of extenuating circumstances (including weather shutdowns, data processing and troubleshooting delays, official personnel travel), I respectfully request a one-week extension to the 120-day submission requirement for survey H12961 (Northwest Savannah, Approaches to Savannah, OPR-G329-TJ-17), sheet number 1 of the project. My team and I expect to submit the survey by 19 January 2018 (vice 12 January 2018).

Please let me know if you have any questions / concerns or require more detail.

V/R,

Chris

--
CDR Chris van Westendorp, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)
co.thomas.jefferson@noaa.gov
Ship Cell1: (757)647-0187 Cell2: (757)418-0629
VoIP: (541)867-8927/8928 Iridium: (808)434-2706
In-Port Norfolk: (757)441-6322/6323

Starla Robinson - NOAA Federal <starla.robinson@noaa.gov> Wed, Jan 10, 2018 at 2:59 PM
To: CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>
Cc: Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "chiefst.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>

Hello CO Thomas Jefferson,

Given the circumstances listed as well as your hurricane response, I see no reason why a one-week extension should not be granted. HSD OPS grants a one-week extension to the Thomas Jefferson for H12961. Thank you for keeping us apprised of the situation. Copy this email into your correspondence folder.

Thanks,
Starla
[Quoted text hidden]
--
Starla D. Robinson, Physical Scientist
NOS - OCS - Hydrographic Survey Division - Operations Branch
National Oceanic Atmospheric Administration
Office: ***240-533-0034*** ***(Updated 6/13/17)***
Cell: 360-689-1431
Website: HSD Planned Hydrographic Surveys

ChiefST.Thomas Jefferson - NOAA Service Account
<chiefst.thomas.jefferson@noaa.gov>

updated offsets to survey launches and their effect on sheet H12961; Coming to a theater near you!

3 messages

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Sat, Oct 21, 2017 at 6:20 PM
To: "ChiefST.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>

Hi Chief,

the lever arms for the launches for sheet H12961 were set (meters) in POSView to:
X: -0.880
Y: -0.676
z: -3.792

following the email from LCDR Greenaway, on 9/23 we corrected these to:

2903:	2904:
X: -0.742	X: -0.732
Y: -0.719	Y: -0.719
Z: -3.560	Z: -3.560

Focusing on 2903 which is the only launch used for the sheet, the Z value at the time was about 25cm too long. This will make the launch data that much too deep. This could account for a part (about half) of the offset with the ship. Note that the ship offset between the antenna and IMU was about 8cm too short...

Is there a way to correct this post?

--

Douglas Wood
Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey
National Oceanic and Atmospheric Administration
1315 East West Highway
Silver Spring, MD 20910
240-533-0042

ChiefST.Thomas Jefferson - NOAA Service Account Sat, Oct 21, 2017 at 6:52 PM
<chiefst.thomas.jefferson@noaa.gov>
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Max Andersen - NOAA Federal <Max.Andersen@noaa.gov>, Garrison Grant - NOAA Federal <garrison.grant@noaa.gov>

Survey/Ops Team-

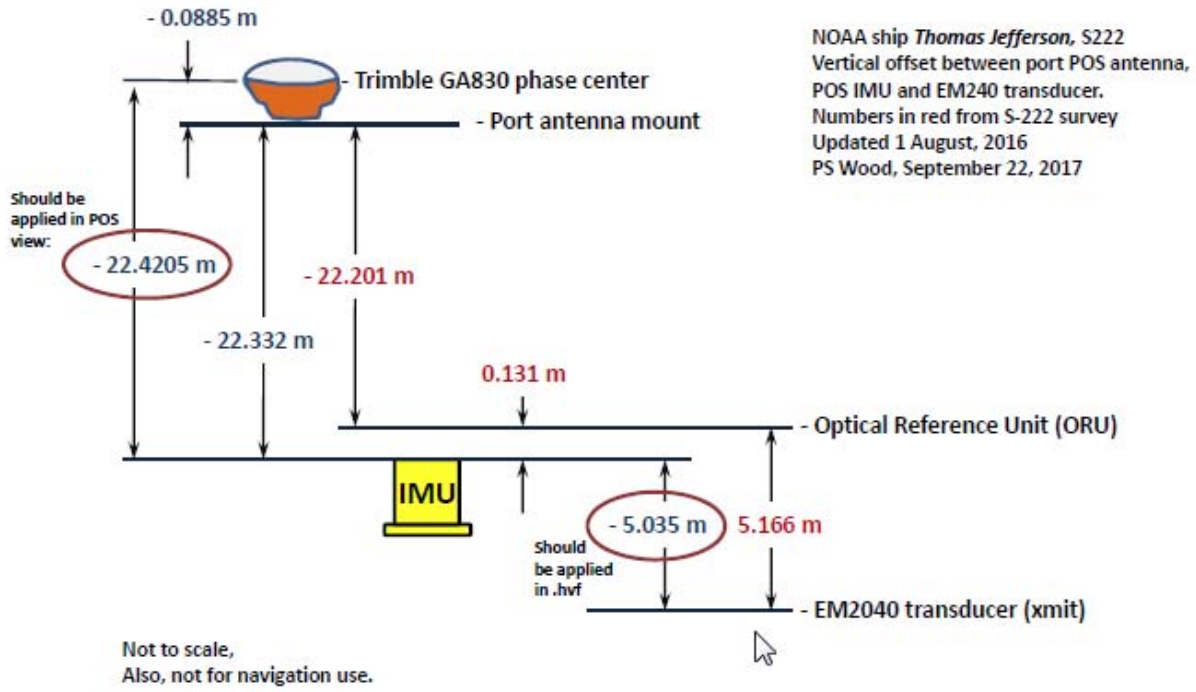
After some noodling today, Doug believes (and has convinced me) that the majority of the vertical offset between S222 and 2903 is coming from the delayed change to the installation parameters in the POS settings of 2903. See the numbers and diagram (by PS Wood) below.

In simplistic terms, the changes to the X,Y,Z values would make the launch data 25cm shallower and the ship data 8cm deeper. This adjustment would bring the vertical difference between vessels a total of 33cm **closer** together.

The tricky part is getting a blessing from the powers that be to post-acq adjust the values--if it can be done in a controlled fashion. The question that then arises is where do we do this? The HVF? Shift the surface values? In a black hole?

I would like to propose finding out if there is somewhere in the HVF this additional Z value can be entered, and if yes, attempt to re-merge the data with the delta Z figures (In a test-project first!!). If we see success, then write to the overlords of hydrography and request permission to submit the post-jiggered data.

Also, SBET issues persist with S222 DN232 and 2903 DN234; ironically, these are not days that show great vertical offsets.



[Quoted text hidden]

--

Allison C. Stone

NOAA Ship *Thomas Jefferson*

757-647-0187 ship cell
541-867-8927 voip
808-434-2706 irridium

Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov> Sat, Oct 21, 2017 at 10:19 PM
To: "ChiefST.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>
Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Max Andersen - NOAA Federal <Max.Andersen@noaa.gov>, Garrison Grant - NOAA Federal <garrison.grant@noaa.gov>

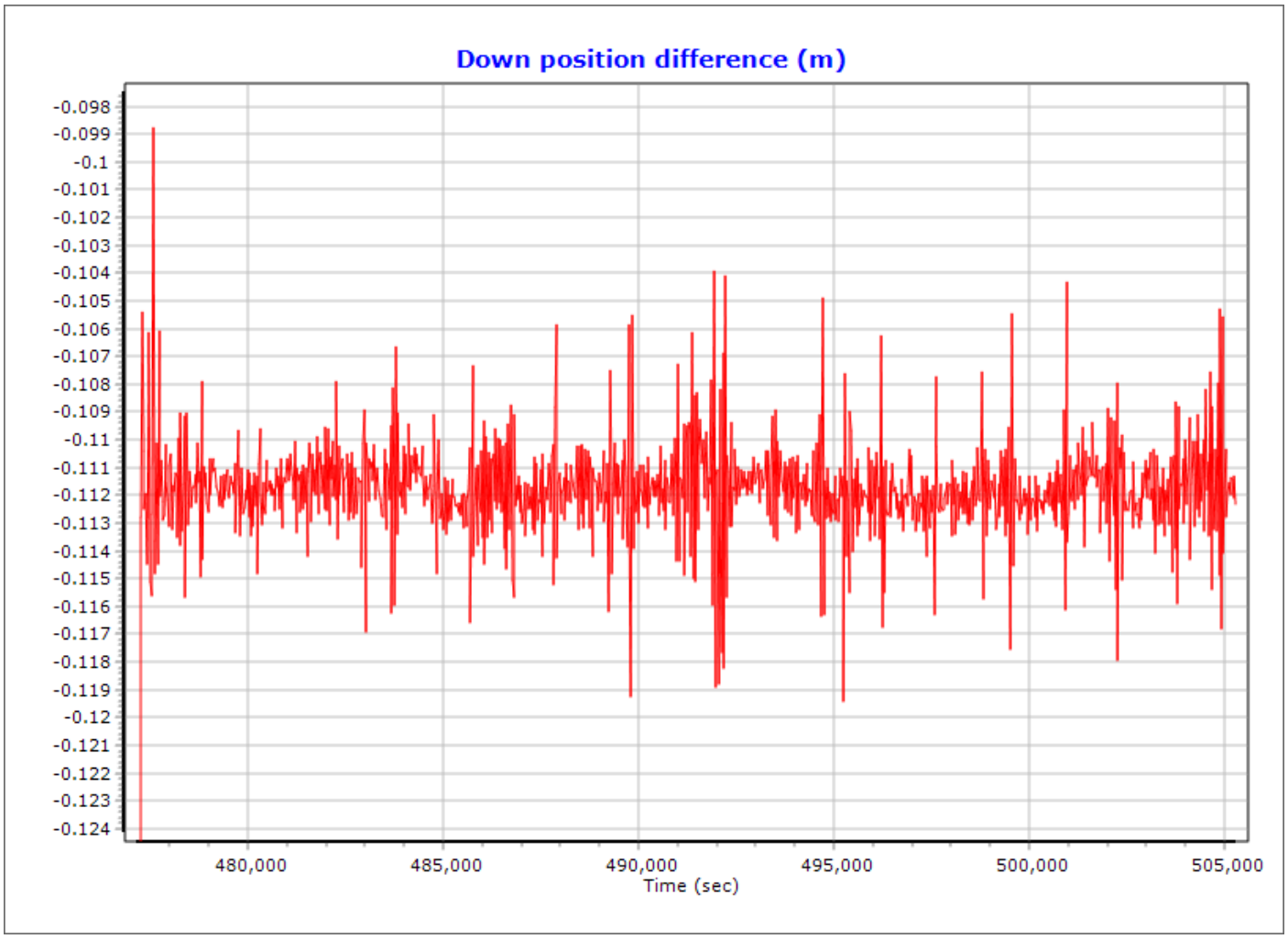
There is a way to process SBETs in POSPac using user entered-offset values.

I processed two projects for the launch in POSPac:

1. A project with the original offsets (the ones that were in POSView), and

2. A project using the new offsets (the ones Doug outlined) with new GAMS values (there is a way to post process these in POSPac as well.

Here are the NAVDIF results (new-offset-SBET with the old-offset-SBET



The mean down difference between SBETS is about -0.11 m.

I'll work on the SBET for S222 after POD is distro'd.

The new SBETs are here:

H:\For CST\H12961_SBET_With_New_Offset_Values
[Quoted text hidden]
--

LT Charles J. Wisotzkey, NOAA
NOAA Ship Thomas Jefferson (S-222)

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov>

NOAA Ship Thomas Jefferson Marine Mammal Sightings

2 messages

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov> Mon, Jan 22, 2018 at 4:10 PM
To: _NMFS AFSC NMML POP INFORMATION <pop.information@noaa.gov>

Good Morning,

I apologize for the delay; I misunderstood how marine mammal sightings are transmitted via AMVER/SEAS. I thought these observations were automatically transmitted to POP at the time the report is generated in AMVER/SEAS, but now I am aware that is not the case. Attached are sightings (in the AMVER/SEAS interface .txt format) for NOAA Ship *Thomas Jefferson* for the Approaches to Savannah 14 Aug 2017 - 15 Sept 2017. I apologize again.

Thank you in advance,

--
ENS Jacquelyn Putnam, NOAA
Junior Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706
Jacquelyn.Putnam@noaa.gov

9 attachments

- **Thomas Jefferson_20170913120408_MARINE_MAMMAL.txt** 2K
- **Thomas Jefferson_20170913151018_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20170913151027_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20170815102436_MARINE_MAMMAL.txt** 2K
- **Thomas Jefferson_20170815102653_MARINE_MAMMAL.txt** 2K
- **Thomas Jefferson_20170817155028_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20170823211339_MARINE_MAMMAL.txt** 1K

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov>

NOAA Ship Thomas Jefferson Marine Mammal Sightings

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov> Mon, Jan 22, 2018 at 4:13 PM
To: _NMFS AFSC NMML POP INFORMATION <pop.information@noaa.gov>

Good Morning,

I apologize for the delay; I misunderstood how marine mammal sightings are transmitted via AMVER/SEAS. I thought these observations were automatically transmitted to POP at the time the report is generated in AMVER/SEAS, but now I am aware that is not the case. Attached are sightings (in the AMVER/SEAS interface .txt format) for NOAA Ship *Thomas Jefferson* for the Approaches to Savannah 18 Oct 2017 - 09 Nov 2017. I apologize again.

Thank you in advance,

--
ENS Jacquelyn Putnam, NOAA
Junior Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706
Jacquelyn.Putnam@noaa.gov

5 attachments

- **Thomas Jefferson_20171021175510_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20171023153746_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20171023160648_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20171023160702_MARINE_MAMMAL.txt** 1K
- **Thomas Jefferson_20171102195329_MARINE_MAMMAL.txt** 1K

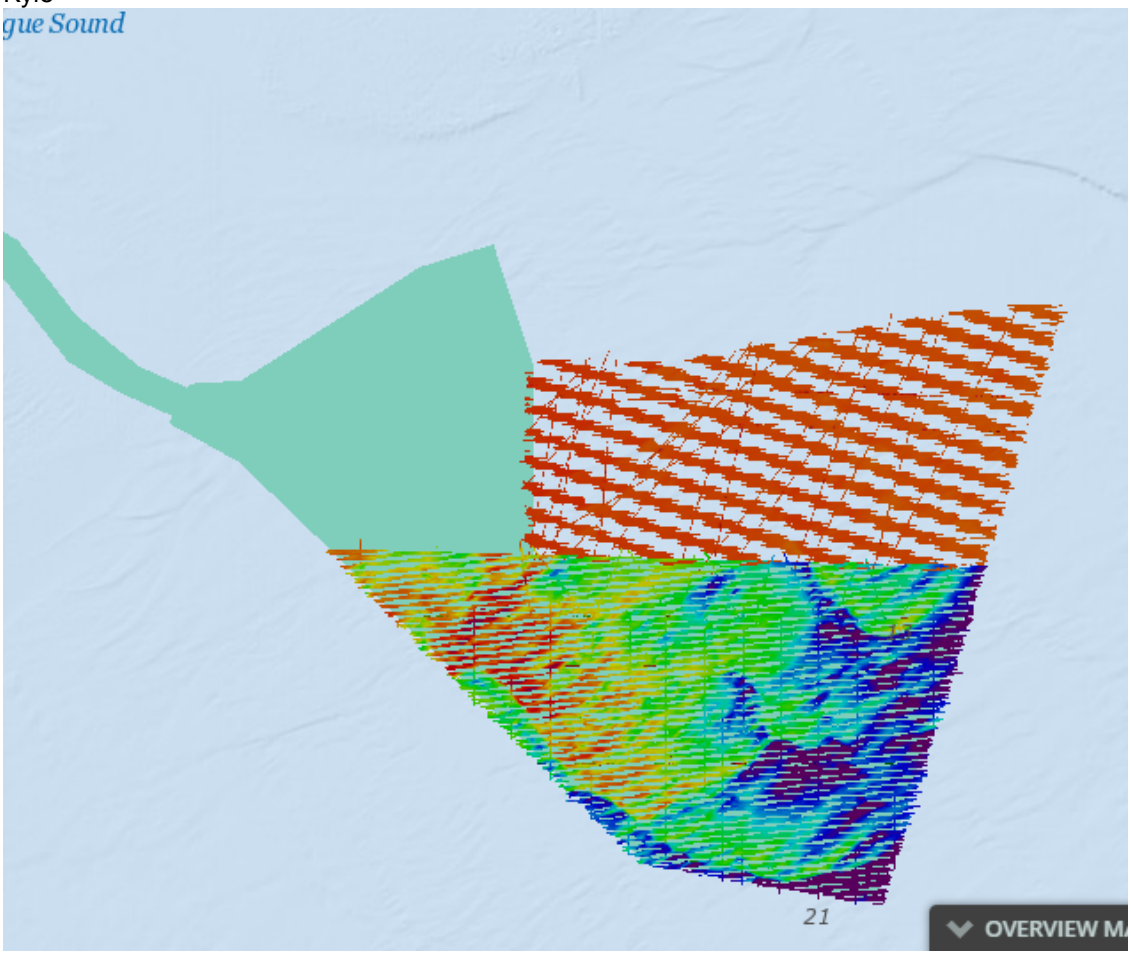
Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>

Savannah Coverage

2 messages

Kyle Ward - NOAA Federal <kyle.ward@noaa.gov> Thu, Jan 18, 2018 at 12:25 PM
To: Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov>

Anthony,
Can you send me a graphic of the area you covered on Savannah project. I was not aware that you got any of the Northeast sheet completed but the HSD Story map shows some coverage(Red). Did you guys completed this area or are you headed back? I am attending a SE mapping meeting next week and it would be nice to show them what was completed. The NE sheet is very important because it is where most of the ships will transit once they leave the extended channel.
Thanks,
Kyle



Kyle R. Ward
Southeast Navigation Manager
NOAA Office of Coast Survey
301.651.4852 cell

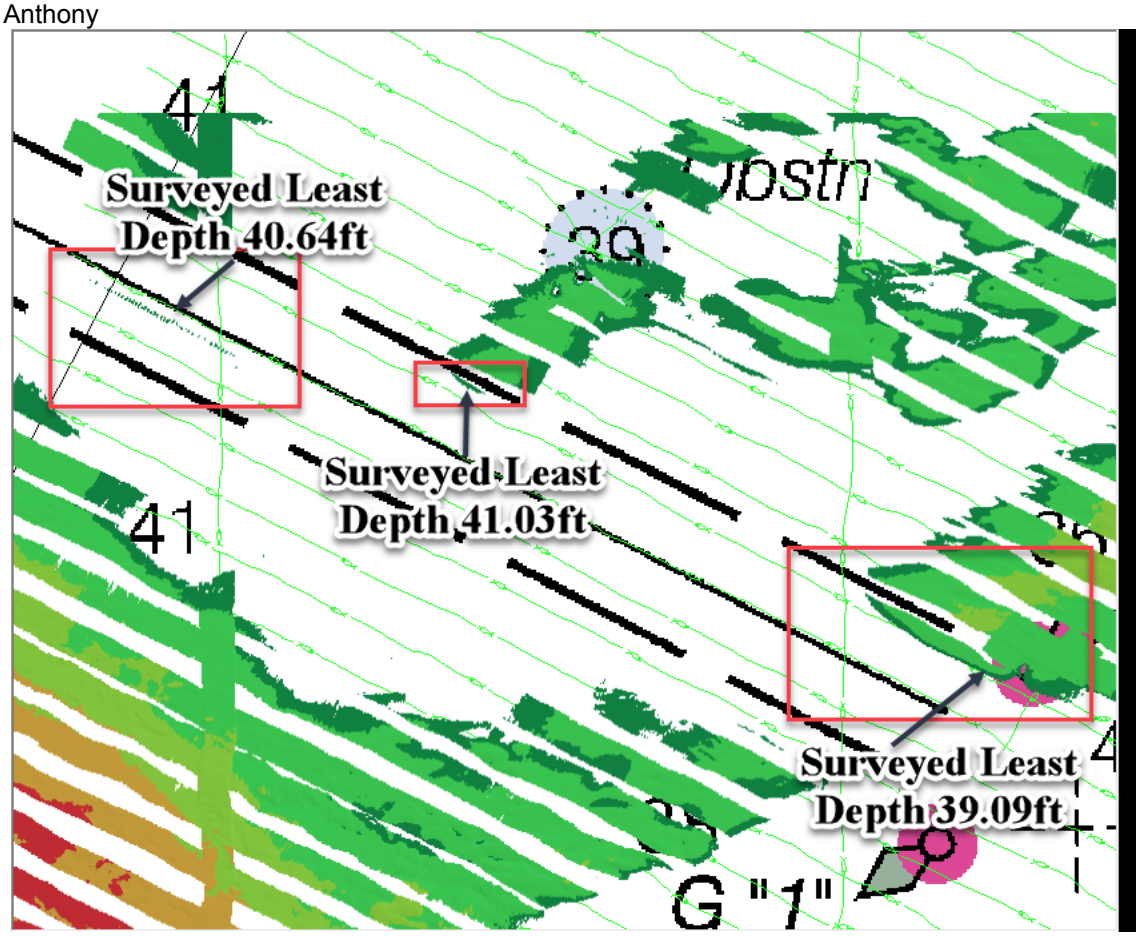
Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov> Thu, Jan 18, 2018 at 1:33 PM
To: Kyle Ward - NOAA Federal <kyle.ward@noaa.gov>
Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Hi Kyle,

We completed the NE sheet (H12960) in 2016. I'm not sure whether it is still at AHB in the compilation stage, or is at MCD already. We completed H12961 and H12962, and also a small part of H12963 before we left the area in 2017. We have not been tasked with any additional Savannah work for this coming field season. We also completed a chart-cleanup feature investigation project in this area, and were able to disprove at least 11 wreck-PAs.

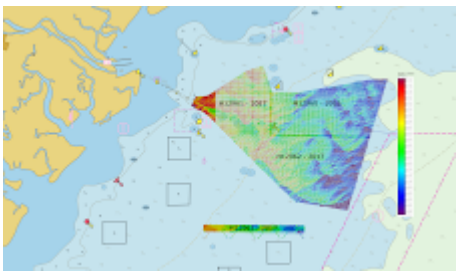
Also, we are finalizing H12961 for submission to AHB, and found some depths shallower than on the channel tab near R"2". I don't know if it's of concern or if the USACE and Pilots are aware of this, and it may have already changed since the time of survey (fall 2017), but I wanted to make you aware of what we have seen. Let us know if you have any additional questions.

Best,
Anthony



LT Anthony Klemm, NOAA
Field Operations Officer
NOAA Ship *Thomas Jefferson*
439 W York Street
Norfolk, VA 23510
757-647-0187

Learn about NOAA nautical charts - www.nauticalcharts.noaa.gov
[Quoted text hidden]



Savannah Survey Project - TJ .png
2856K

Allison Stone - NOAA Federal <allison.c.stone@noaa.gov>

Fwd: results from reference surface comparison

1 message

Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov> Tue, Jan 2, 2018 at 8:38 PM
To: Allison Stone <allison.c.stone@noaa.gov>

LT Anthony Klemm, NOAA
Field Operations Officer
NOAA Ship *Thomas Jefferson*
439 W York Street
Norfolk, VA 23510
757-647-0187

Learn about NOAA nautical charts - www.nauticalcharts.noaa.gov

---------- Forwarded message ----------
From: **Anthony Klemm - NOAA Federal** <anthony.r.klemm@noaa.gov>
Date: Sat, Sep 16, 2017 at 4:48 PM
Subject: results from reference surface comparison
To: _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>
Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, _OMAO MOA ChiefST Thomas Jefferson <chiefst.thomas.jefferson@noaa.gov>

CO,

We ran the numbers on the reference surface between the ship and 2903, and found a mean difference of 0.21m (0.08m std dev). This is consistent from the comparisons we made between overlapping ship and launch data on H12961 (0.22m mean difference; 0.14m std dev).

Doug and I did a comprehensive review of our .hvfs and POSMV offset values, and found everything in order with no obvious culprit to the 20cm offset. Although I would like it to be a zero mean depth difference, 20cm (~8 inches, just a bit taller than a soda can) isn't too bad.

Unless directed otherwise, I have no plans to pursue the root cause of the offset in the immediate future.

Best regards,
Anthony

LT Anthony Klemm, NOAA
NOAA Ship *Thomas Jefferson*
439 W York Street
Norfolk, VA 23510

Learn about NOAA nautical charts - www.nauticalcharts.noaa.gov

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov>

Thomas Jefferson Marine Species Training Notice

2 messages

Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov> Mon, Jul 10, 2017 at 5:54 PM
To: _NOS OCS ECC <ocs.ecc@noaa.gov>
Cc: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>

Good Afternoon,

Please see the attached for a list of NOAA Ship *Thomas Jefferson's* personnel that have completed Marine Species Awareness Training.

Thank you in advance,

--
ENS Jacquelyn Putnam, NOAA
Junior Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706
Jacquelyn.Putnam@noaa.gov

2017TrainedObservers.pdf
130K

Jay Nunenkamp - NOAA Federal <jay.nunenkamp@noaa.gov> Mon, Jul 10, 2017 at 5:56 PM
To: Jacquelyn Putnam - NOAA Federal <jacquelyn.putnam@noaa.gov>
Cc: _NOS OCS ECC <ocs.ecc@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>

Received, thank you.

Sincerely,

Jay Nunenkamp
Environmental Compliance Coordinator
Office of Coast Survey, National Ocean Service
240-533-0118
SSMC3 Room 6513
[Quoted text hidden]

ChiefST.Thomas Jefferson - NOAA Service Account <chiefst.thomas.jefferson@noaa.gov>

Fwd: TJ and launch .hvf files

4 messages

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Sat, Sep 23, 2017 at 4:38 PM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "ChiefST.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>, Samuel Greenaway - NOAA Federal <samuel.greenaway@noaa.gov>

Hi LT Klemm,

LCDR Greenaway suggests updating the antenna offsets on the launch too.

Doug

---------- Forwarded message ----------
From: **Samuel Greenaway - NOAA Federal** <samuel.greenaway@noaa.gov>
Date: Sat, Sep 23, 2017 at 2:20 PM
Subject: Re: TJ and launch .hvf files
To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>
Cc: Glen Rice <Glen.Rice@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <OPS.Thomas.Jefferson@noaa.gov>

Well I think that is the bulk of your problem. The antenna offset in that POS config are from 3101.

You need to change the antenna offsets to:

2803: x: -0.742, y: -0.719, z: -3.560
2804: x: -0.732, y: -0.734, z: -3.566

I will forward the current launch offsets sheets.

Sam

On Fri, Sep 22, 2017 at 6:05 PM, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> wrote:
> Here is a screen shot of 2904
>
> On Fri, Sep 22, 2017 at 9:24 PM, Sam Greenaway <samuel.greenaway@noaa.gov> wrote:
> > We can't read that easily. Can you open pos controller and send a screenshot of the installation offfsets?
> >
> > Sam
> >
> > On Sep 22, 2017, at 4:17 PM, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> wrote:
> >
> >
> > Will this do?
> >
> > from launch 2904
> >
> > On Fri, Sep 22, 2017 at 7:55 PM, Samuel Greenaway - NOAA Federal <samuel.greenaway@noaa.gov> wrote:
> > > Thanks, do you also have the launch POS configs. Specifically the ref to primary GNSS ant.
> > >
> > > Sam
> > >
> > > On Fri, Sep 22, 2017 at 3:45 PM, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> wrote:
> > > > attached
> > > >
> > > > --

Douglas Wood
Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey
National Oceanic and Atmospheric Administration
1315 East West Highway
Silver Spring, MD 20910
240-533-0042

--
LCDR Samuel Greenaway, NOAA
Chief, Hydrographic Systems and Technology Branch
Office of Coast Survey
National Oceanic and Atmospheric Administration
cell: 206-427-9554
office: 240-847-8241

--

Douglas Wood
Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey
National Oceanic and Atmospheric Administration
1315 East West Highway
Silver Spring, MD 20910
240-533-0042

<Posconfig_2904_Marinestar_09112017.nvm>

--

Douglas Wood
Physical Scientist
Hydrographic Surveys Division
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--
LCDR Samuel Greenaway, NOAA
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--

Douglas Wood
Physical Scientist

Hydrographic Surveys Division
Office of Coast Survey
National Oceanic and Atmospheric Administration
1315 East West Highway
Silver Spring, MD 20910
240-533-0042

ChiefST.Thomas Jefferson - NOAA Service Account <chiefst.thomas.jefferson@noaa.gov> Sun, Sep 24, 2017 at 4:18 PM
To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>
Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

As of COB 9/23- all 3 platforms have been updated.

R,
[Quoted text hidden]
--
Allison C. Stone
NOAA Ship *Thomas Jefferson*
757-647-0187 ship cell
541-867-8927 voip
808-434-2706 irridium

Anthony Klemm - NOAA Federal <anthony.r.klemm@noaa.gov> Sun, Sep 24, 2017 at 4:28 PM
To: "ChiefST.Thomas Jefferson - NOAA Service Account" <chiefst.thomas.jefferson@noaa.gov>
Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Amazing. Thanks guys.

LT Anthony Klemm, NOAA
Field Operations Officer
NOAA Ship *Thomas Jefferson*
439 W York Street
Norfolk, VA 23510
757-647-0187

Learn about NOAA nautical charts - www.nauticalcharts.noaa.gov
[Quoted text hidden]

ChiefST.Thomas Jefferson - NOAA Service Account <chiefst.thomas.jefferson@noaa.gov> Fri, Oct 20, 2017 at 12:39 PM
To: Charles Wisotzkey <charles.j.wisotzkey@noaa.gov>

---------- Forwarded message ----------
From: **Anthony Klemm - NOAA Federal** <anthony.r.klemm@noaa.gov>
Date: Sun, Sep 24, 2017 at 4:28 PM
Subject: Re: TJ and launch .hvf files
[Quoted text hidden]
[Quoted text hidden]

Allison Stone - NOAA Federal <allison.c.stone@noaa.gov>

Fwd: Checking vertical offsets on TJ, sanity check.

1 message

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Sat, Oct 21, 2017 at 6:48 PM
To: Allison Stone - NOAA Federal <allison.c.stone@noaa.gov>

The Greena-way way:

---------- Forwarded message ----------
From: **Samuel Greenaway - NOAA Federal** <samuel.greenaway@noaa.gov>
Date: Fri, Sep 22, 2017 at 7:11 PM
Subject: Re: Checking vertical offsets on TJ, sanity check.
To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>
Cc: Glen Rice <Glen.Rice@noaa.gov>

Doug,

This issue was caught back in March, so a bit odd it has resurfaced.

A couple of things first though. The survey report actually lists four different frames (ship, IMU, ORU, and 710tx). You look to be using the ORU table and translating to the IMU. you should use the IMU table instead. The offsets are slightly different because the ORU and IMU are not aligned. The IMU is defined as the RP for the TJ.

But yes, the set-up as described in the Acceptance report did not have this offset. This will get fixed and re-issued.

The correct offset, in the POS, for the Ref. to Primary GNSS Lever arm should be x: -9.937, y: 1.389, z: -22.427

Also, when they re-installed the 2040 after the survey, 6mm of shims were added. It looks like you have that in your numbers, but you are again using the ORU frame. The offset from the IMU to the 2040 tx in the IMU frame (including the shim) is 5.011. This goes in the HVF.

This make sense?

Can you send the launch and ship MB HVFs?

Sam

On Fri, Sep 22, 2017 at 1:51 PM, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> wrote:

> Hi LCDR Greenaway,
>
> the *TJ* has been suffering from a vertical offset between ship and launch data where the ship reports depth ~20 cm shoal of the launches. The vertical offset (IMU to antenna) currently in POSview is -22.338 m and the vertical offset from IMU to EM2040 transducer in the latest .hvf is 5.022. I think that if my numbers are correct and are implemented the ship's reported processed depths will be 10cm deeper.
>
> I think that they forgot to add the offset to the antenna phase center.
>
> I suspect that you have access to the ship's offsets; do these numbers look correct to you?
>
> attached
>
> Doug

> --
>
> Douglas Wood
> Physical Scientist
> Hydrographic Surveys Division
> Office of Coast Survey
> National Oceanic and Atmospheric Administration
> 1315 East West Highway
> Silver Spring, MD 20910
> 240-533-0042

--
LCDR Samuel Greenaway, NOAA
Chief, Hydrographic Systems and Technology Branch
Office of Coast Survey
National Oceanic and Atmospheric Administration
cell: 206-427-9554
office: 240-847-8241

--

Douglas Wood
Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey
National Oceanic and Atmospheric Administration
1315 East West Highway
Silver Spring, MD 20910
240-533-0042

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations
NOAA Ship *Thomas Jefferson* (S222)
439 West York St, Norfolk, VA 23510

1/18/2018

MEMORANDUM FOR: Starla Robinson
Project Manager, OPR-G329-TJ-17
Hydrographic Surveys Division Operations Branch

FROM: Commander Chris van Westendorp, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*

THROUGH: Lieutenant Anthony Klemm, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*

KLEMM.ANTHONY.ROSS.1392701601
Digitally signed by KLEMM.ANTHONY.ROSS.1392701601
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=KLEMM.ANTHONY.ROSS.1392701601
Date: 2018.01.24 08:04:31 -05'00'

SUBJECT: Waiver request – crossline spacing

Thomas Jefferson requests a waiver of the Hydrographic Surveys Specifications and Deliverables requirement that crosslines are collected within 1 kilometer of each other for survey H12961. In order to meet this distance requirement, the crossline mileage exceeds more than 8% of the mainscheme lineal mileage.

Justification

In the limited survey time, more emphasis should be given to mainscheme data collection. Collecting the HSSD required 4% crosslines of mainscheme lineal mileage will suffice.

Decision

HERZOG.MARTHA.C.1365899530
Signed for Starla Robinson
2018.07.18 08:28:58 -04'00'

Waiver is: Granted _____ Denied _____

cc: Chief, HSD OPS
OPS, *Thomas Jefferson*
HCST, *Thomas Jefferson*

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations
NOAA Ship *Thomas Jefferson* (S222)
439 West York St, Norfolk, VA 23510

6/22/2017

MEMORANDUM FOR: Starla Robinson
Project Manager, OPR-G329-TJ-17
Hydrographic Surveys Division Operations Branch

FROM: Commander Chris van Westendorp, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*

VAN WESTENDORP.CHRISTIAAN.HENRY.1012828175
c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=VAN WESTENDORP.CHRISTIAAN.HENRY.1012828175
2017.06.22 10:51:49 -04'00'

SUBJECT: Waiver request – WGS84 Datum

Thomas Jefferson requests a waiver of the HSSD 2017 Section 2.2 Horizontal Datum requirement to acquire survey data for project OPR-G329-TJ-17 in WGS84 rather than NAD83.

Justification

Retaining the current procedure and configurations will reduce the possibility of errors.

Decision

Waiver is: Granted _____ Denied _____

cc: Chief, HSD OPS
OPS, *Thomas Jefferson*
HCST, *Thomas Jefferson*

APPROVAL PAGE

H12961

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

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- Processed survey data and records
- GeoPDF of survey products

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.

Briana Welton Hillstrom

Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531
Date: 2018.07.27 14:10:17 -04'00'

Approved: _____

Commander Briana W. Hillstrom, NOAA
Chief, Atlantic Hydrographic Branch