

H13327

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H13327

LOCALITY

State(s): North Carolina
Virginia

General Locality: Approaches to Chesapeake Bay

Sub-locality: 26 NM Offshore of False Cape, VA

2019

CHIEF OF PARTY
CDR Briana Hillstrom, NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H13327

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 Virginia**

General Locality: **Virginia/North Carolina**

Sub-Locality: **26 NM Offshore of False Cape, VA**

Scale: **40000**

Dates of Survey: **11/11/2019 to 11/22/2019**

Instructions Dated: **10/01/2019**

Project Number: **OPR-D304-TJ-19**

Field Unit: **NOAA Ship Thomas Jefferson (S222)**

Chief of Party: **CDR Briana Hillstrom, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter Side Scan Sonar**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 18N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

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Descriptive Report to Accompany Survey H13327

Project: OPR-D304-TJ-19

Locality: Virginia/North Carolina

Sublocality: 26 NM Offshore of False Cape, VA

Scale: 1:40000

November 2019 - November 2019

NOAA Ship Thomas Jefferson (S222)

Chief of Party: CDR Briana Hillstrom, NOAA

A. Area Surveyed

Survey H13327, located 26 NM Offshore of False Cape, Virginia which is located near the Virginia and North Carolina border.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
36° 42' 19.5" N 75° 22' 18.73" W	36° 29' 50.82" N 75° 18' 4.05" W

Table 1: Survey Limits

Data were acquired within the following survey limits (Table 1 and Figure 1). The sheet limits for H13326 and H13327 were adjusted for efficiency of acquisition operations and to account for platform availability. The adjusted sheet limits were approved by the Project Manager. (See project correspondence documents, Figure 2, and 3).

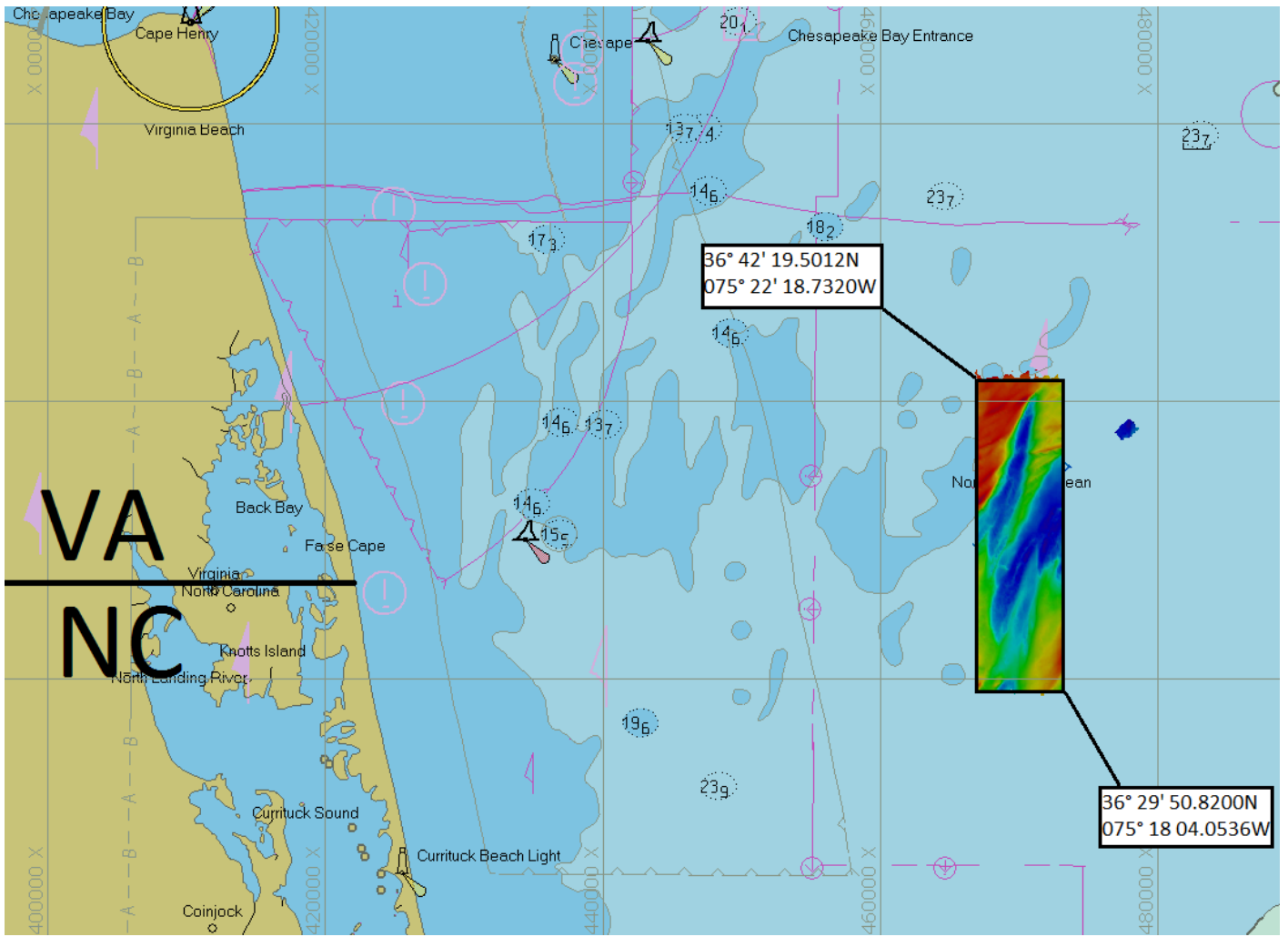


Figure 1: Survey H13327 plotted over ENC US3DE01M.

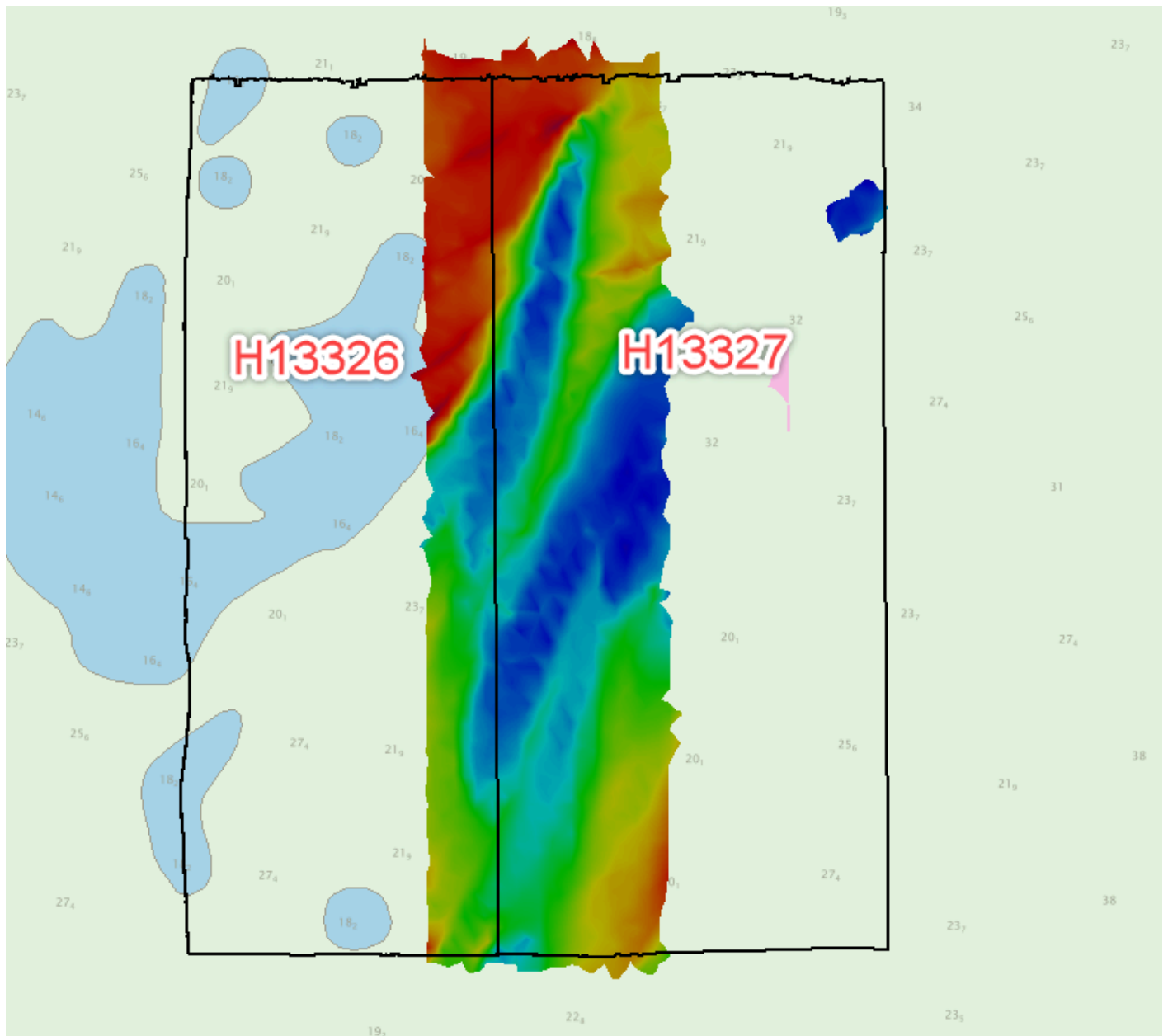


Figure 2: Original sheet limits shown in black as assigned for survey H13326 and H13327.

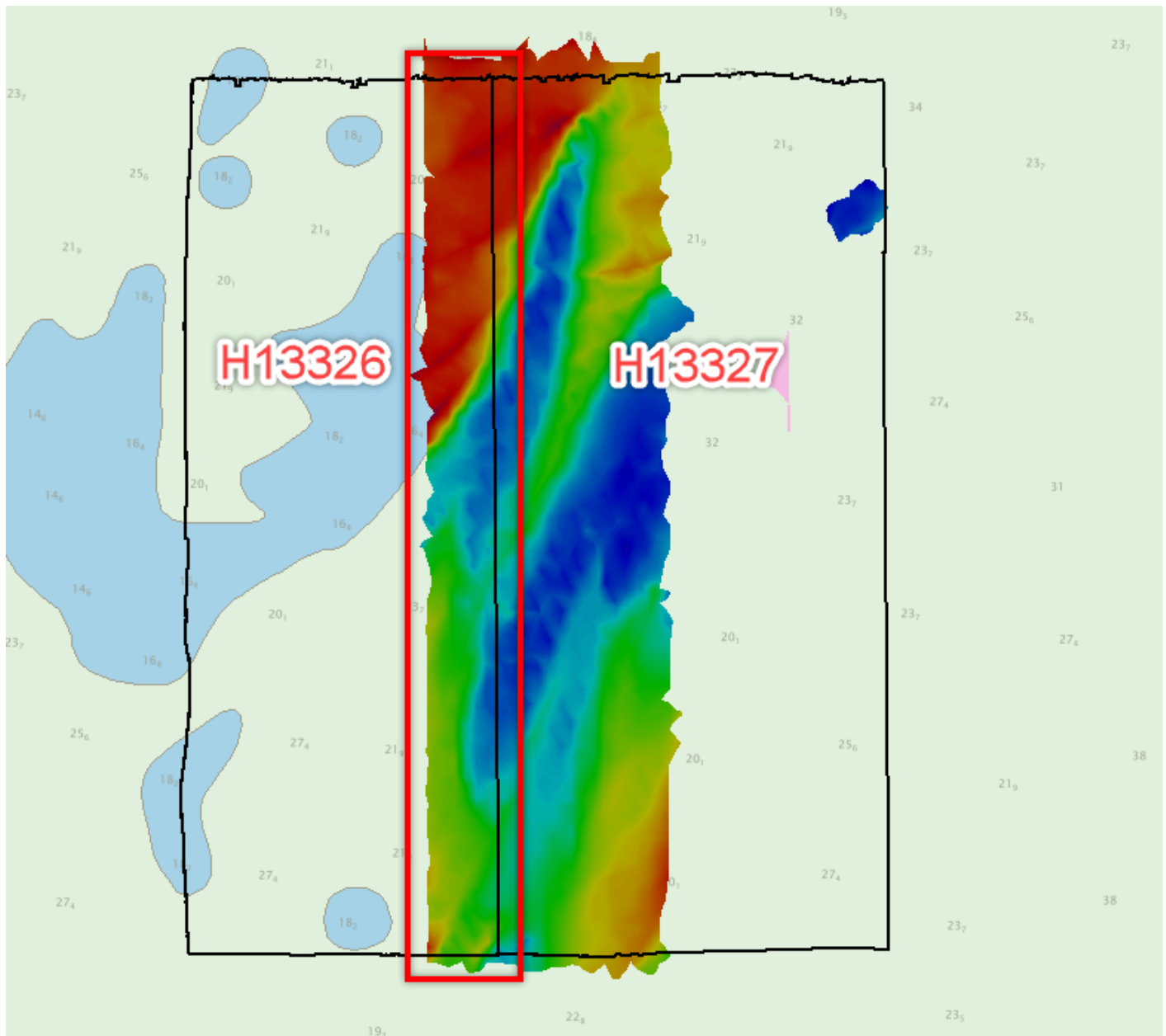


Figure 3: The area highlighted by red box was approved to be assigned to survey H13327 by the project manager.

A.2 Survey Purpose

The purpose of this project is to test the DriX Autonomous Surface Vehicle (ASV) while providing contemporary surveys to update National Ocean Service (NOS) nautical charting products.

This survey will cover 400 SNM of the approach to Hampton Roads, home to the world's largest naval base and a port that annually receives over 5,000 arrivals/departures of deep-draft vessels which continually increase in size over time. Within the survey area, there are currently reported depths that are comparable to

those of the dredged Thimble Shoal Channel. A vessel ballasted for little-under keel clearance in the channel could risk grounding in the working area if uncharted shoaling has occurred. There are likely substantial changes to the seabed since the most recent partial-bottom coverage survey, which took place in the 1930s. This survey is a critical part of an ongoing, multi-year hydrographic survey covering the approaches to Chesapeake Bay to support the safety of commerce and monitor the habitat and the environmental health of the region.

A.3 Survey Quality

The survey is partially adequate to supersede previous data.

See section A.4 Survey Coverage.

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 Coverage (Refer to HSSD Section 5.2.2.3)

Table 2: Survey Coverage

Significant side scan data gaps are present in survey H13327. These data gaps were not observed until the last day of acquisition. After further analysis of the data, the data gaps were observed within data from each day of acquisition. The Klein system, using SonarPro 14.1, was experiencing lag with the following ping collecting data with considerable gaps in coverage with the perception of full coverage. Within Navigation Editor in Caris 10.4, navigation fixes with max distances of 150m between fixes was observed. These areas of increased distances between fixes correlates to the lag that was observed within SonarPro 14.1 during acquisition. (See Figures 4-10 for examples of data gaps in coverage).

Refraction was also observed within data from survey H13327 but does not impede the detection of 1m x 1m x 1m features on the sea floor (See Figure 11).

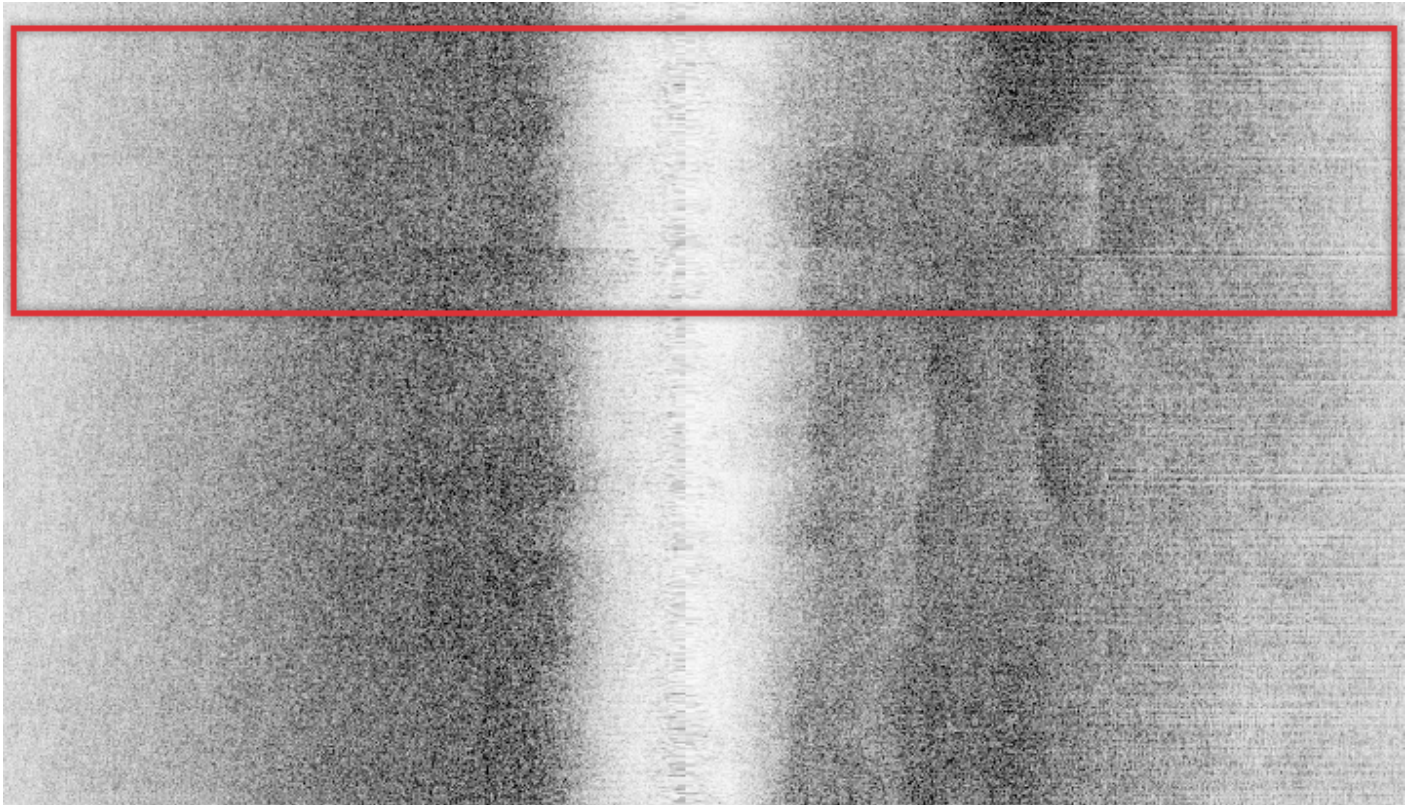


Figure 4: Data gap observed in line 315_191110221400 on Julian day number 315.

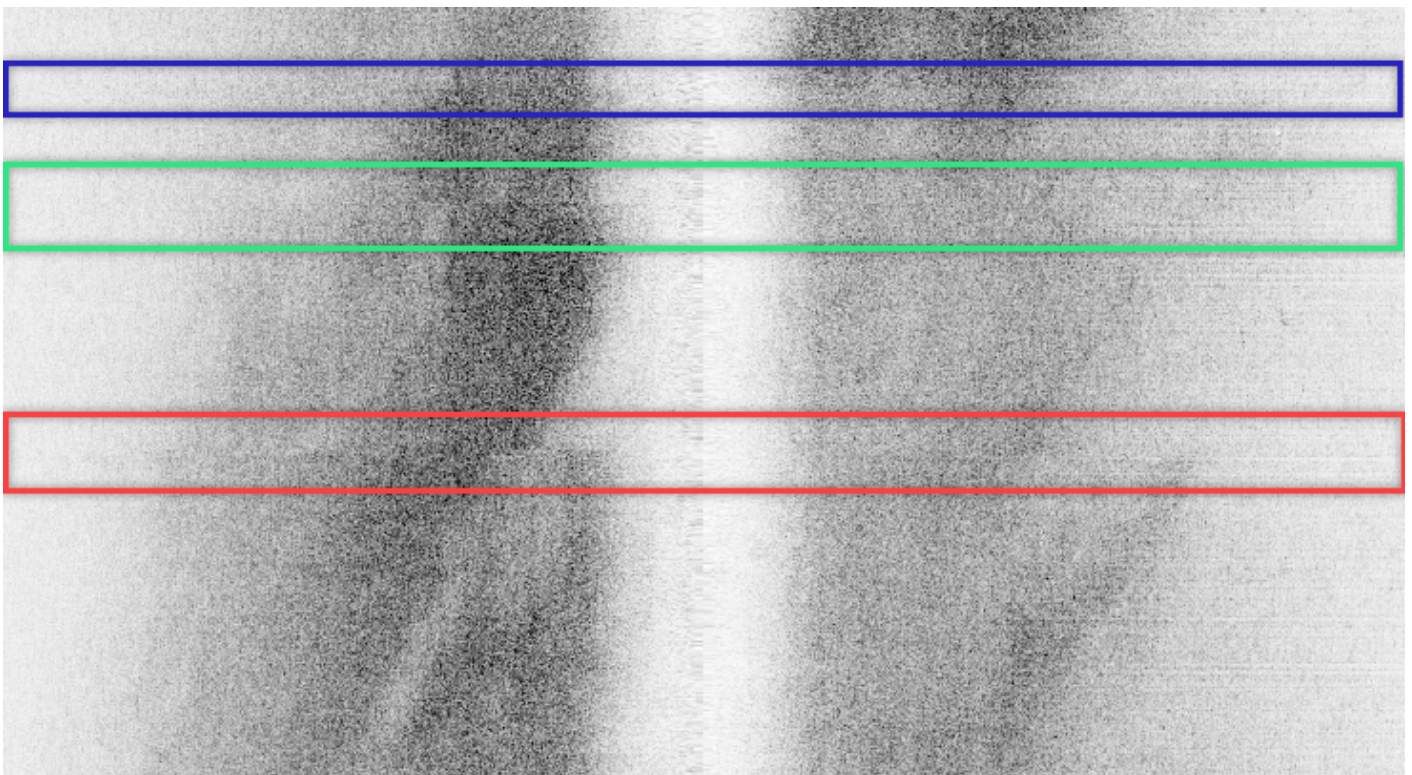


Figure 5: Data gap observed in line 315_191110221400 on Julian day number 315.

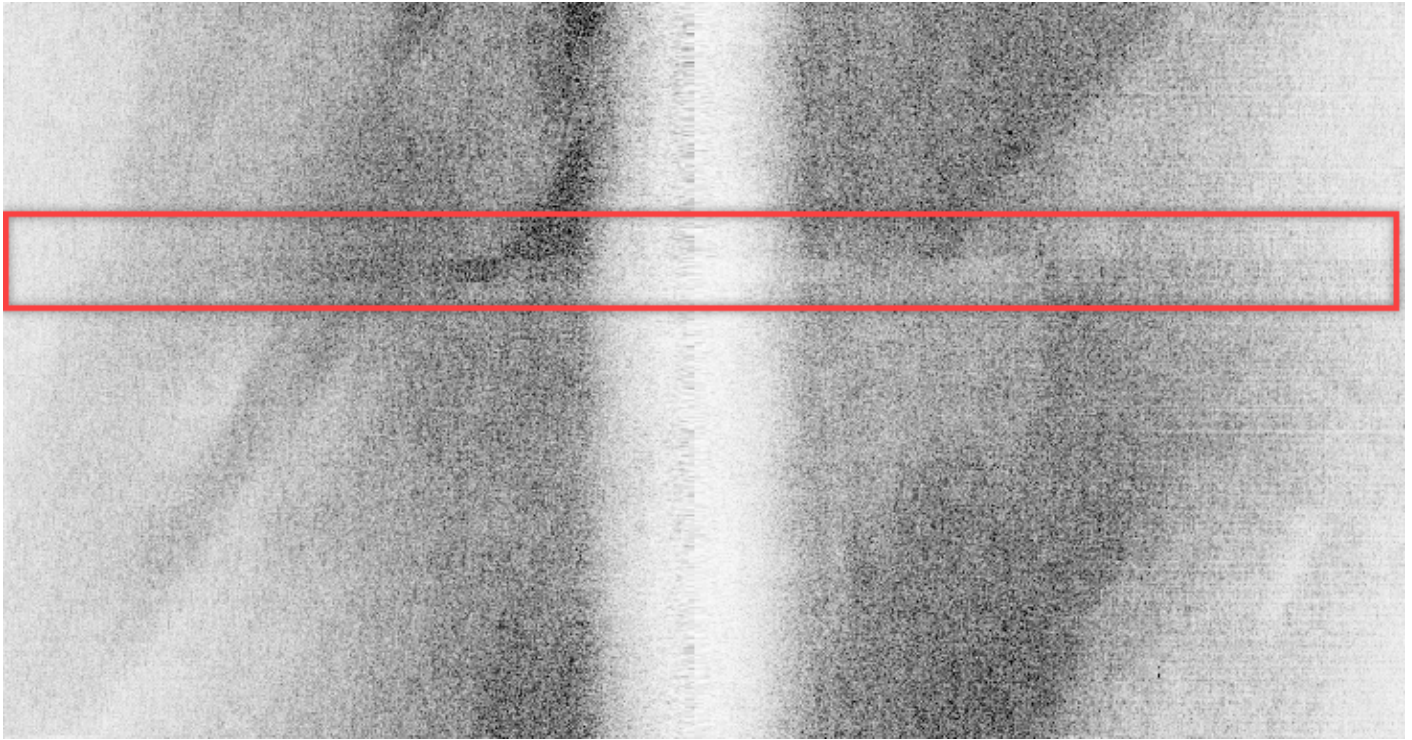


Figure 6: Data gap observed in line 315_191110221400 on Julian day number 315.

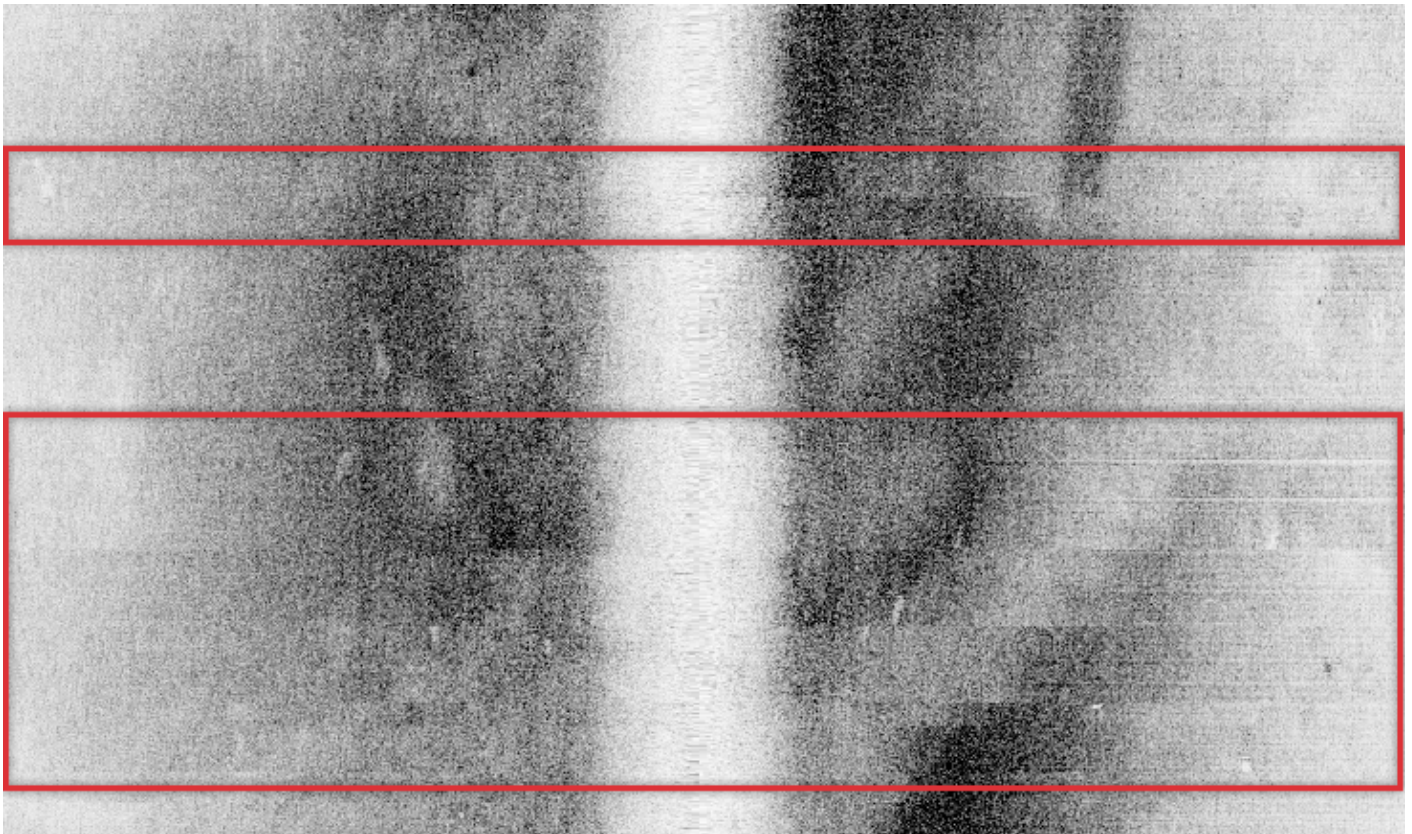


Figure 7: Data gap observed in line 315_191110221400 on Julian day number 315.

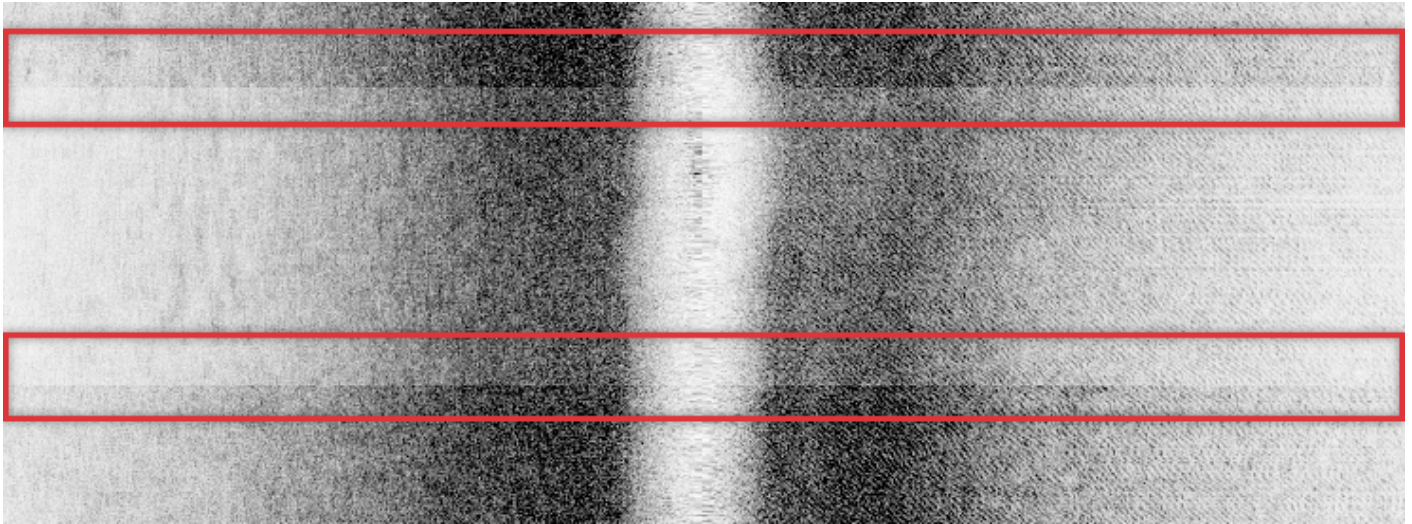


Figure 8: Data gap observed in line 315_191110232500 on day number 315.

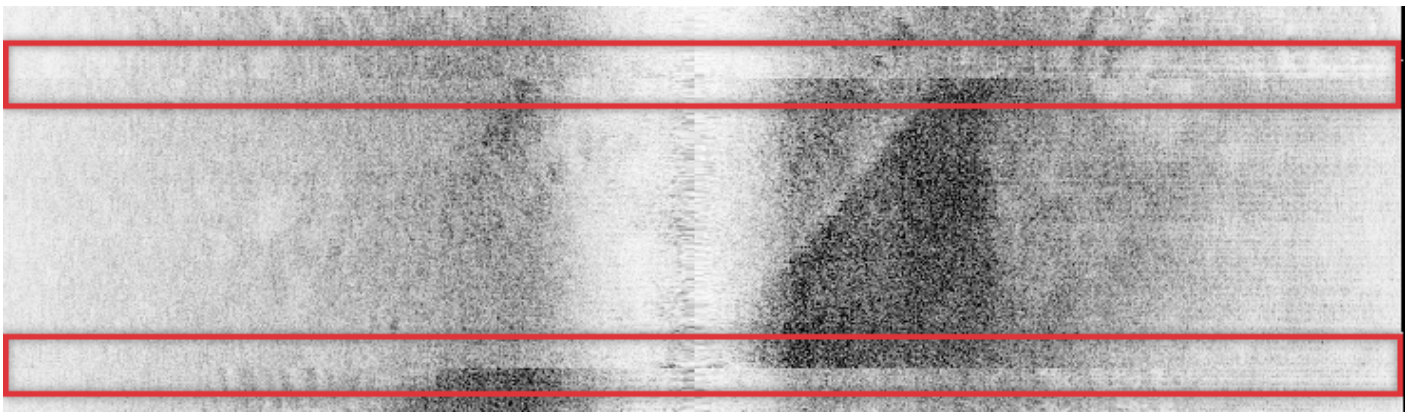


Figure 9: Data gap observed in line 315_191111108300 on day number 315.

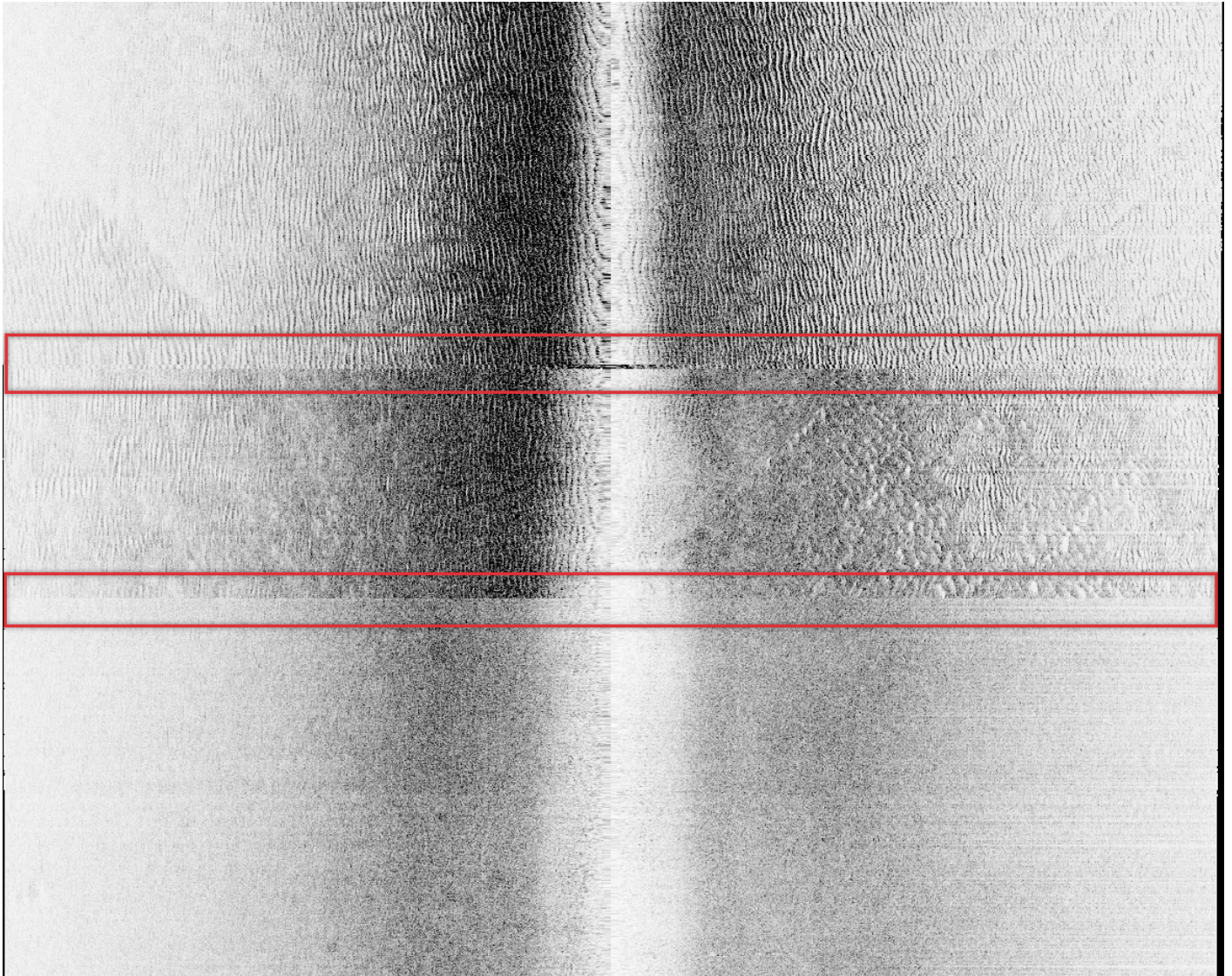


Figure 10: Data gap observed in line 324_191120010900 on day number 324.

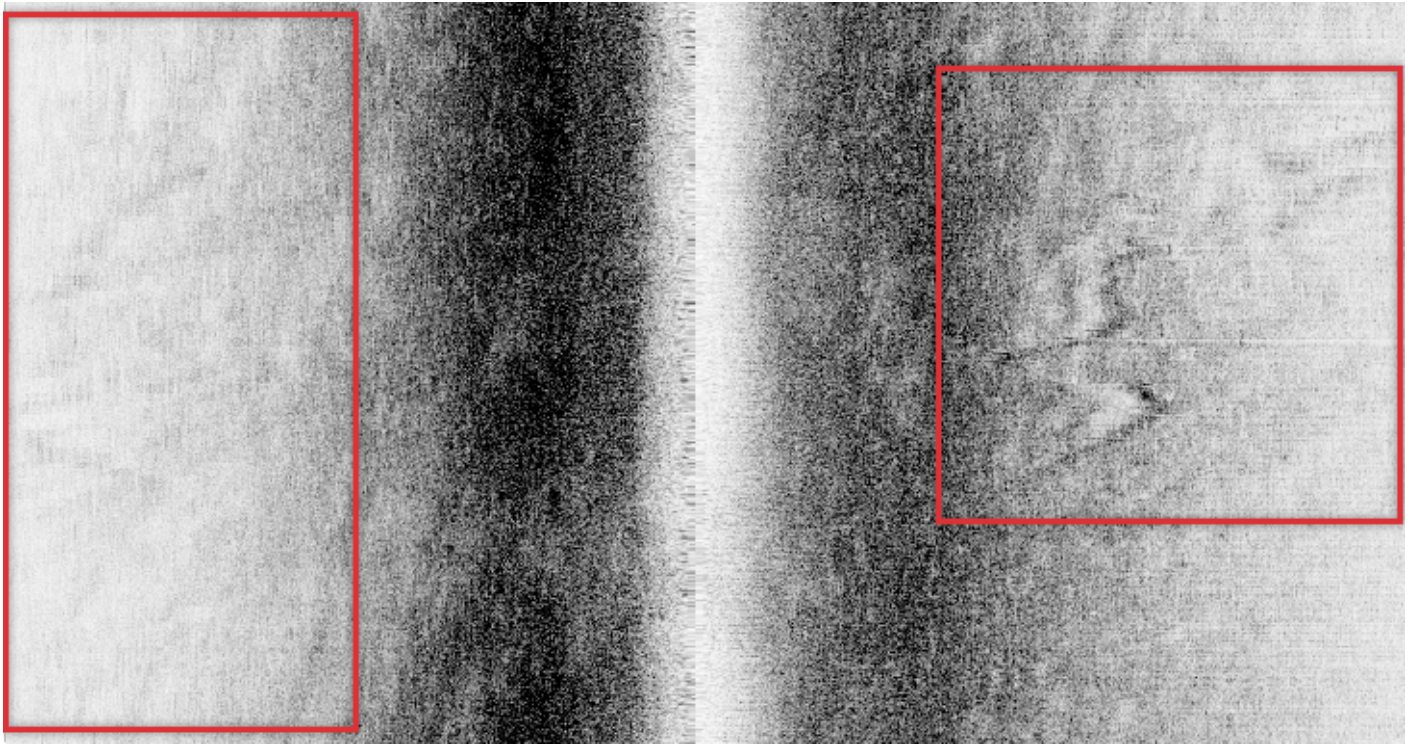


Figure 11: Refraction observed in line 318_B_191114182300 on day number 318_B.

A.6 Survey Statistics

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

	HULL ID	<i>S222</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	0	0
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	525.27	525.27
	SBES/MBES Crosslines	35.08	35.08
	Lidar Crosslines	0	0
Number of Bottom Samples			8
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			46 41.336

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
11/11/2019	315
11/12/2019	316

Survey Dates	Day of the Year
11/14/2019	318
11/15/2019	319
11/19/2019	323
11/20/2019	324
11/21/2019	325
11/22/2019	326

Table 4: Dates of Hydrography

On day 11/22/2019, the ship acquired bottom samples. For a complete discussion, see section D.1.7 Bottom samples.

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	<i>S222</i>
LOA	63.4 meters
Draft	4.6 meters

Table 5: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Klein Marine Systems	System 5000	SSS
Kongsberg Maritime	EM 2040	MBES
Valeport	Thru-Hull SVS	Sound Speed System
AML Oceanographic	MVP100	Sound Speed System
Applanix	POS MV 320 v5	Positioning and Attitude System
AML Oceanographic	SmartX	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

Vessel configurations, equipment operations, data acquisition, and processing were consistent with specifications described in the DAPR.

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 6.68% of mainscheme acquisition.

S222 collected 35.08 linear nautical miles of MBES crosslines. A variable resolution (VR) Combined Uncertainty and Bathymetry Estimator (CUBE) surface of VR mainscheme data and a CUBE VR surface of crossline data were differenced. The resulting mean was -0.01m and the standard deviation 0.07m (Figure 12). Visual inspection of the difference surface and statistical analysis of the difference surface revealed no major issues in the data.

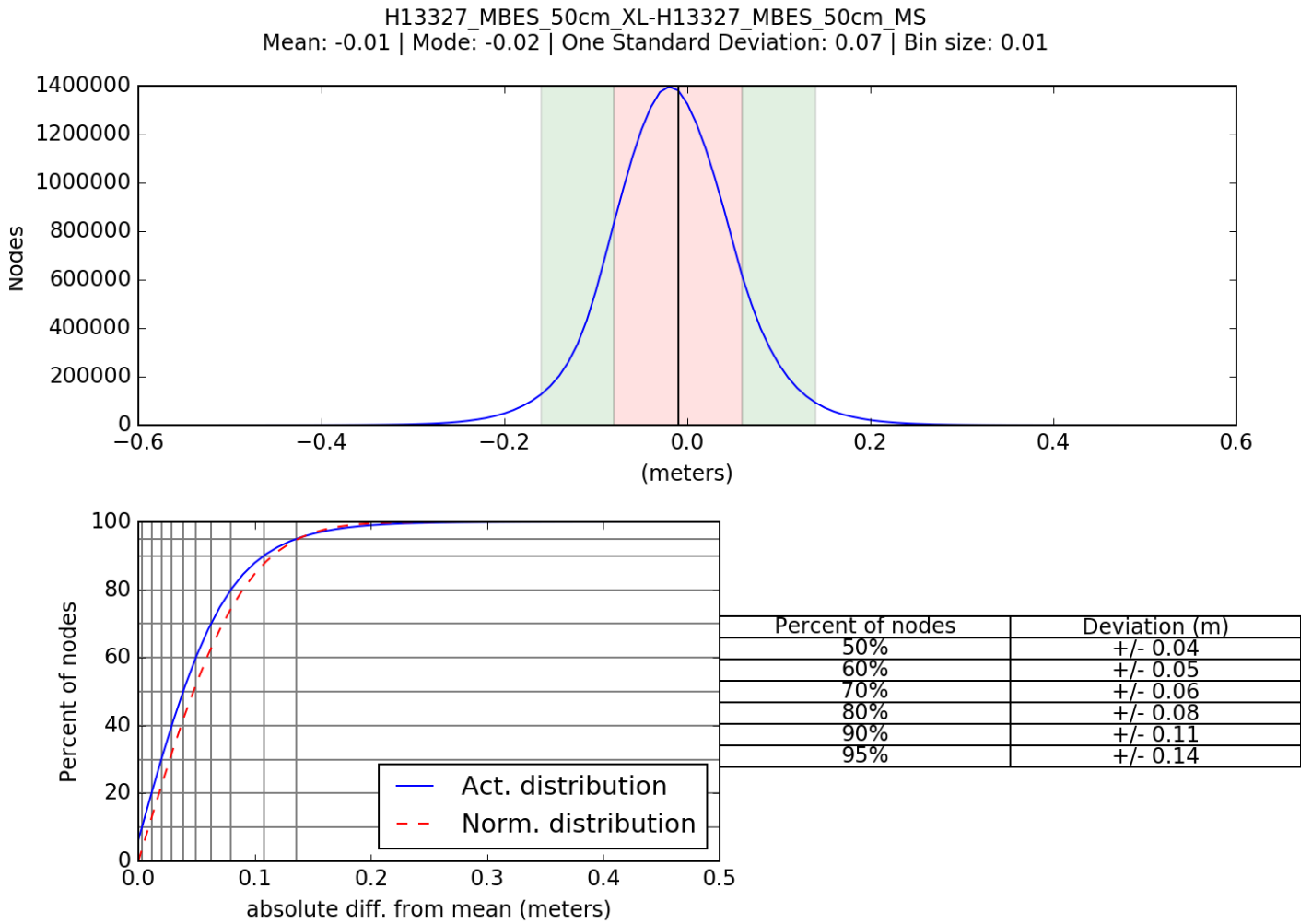


Figure 12: Crossline-mainscheme comparison statistics for survey H13327.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0 meters	0.094 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	4.0 meters/second	2.0 meters/second	0.2 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

The bathymetric surface's uncertainty layer is compliant with HSSD 2019 uncertainty standards. Over 99.5% of all nodes pass uncertainty standards (Figure 13).

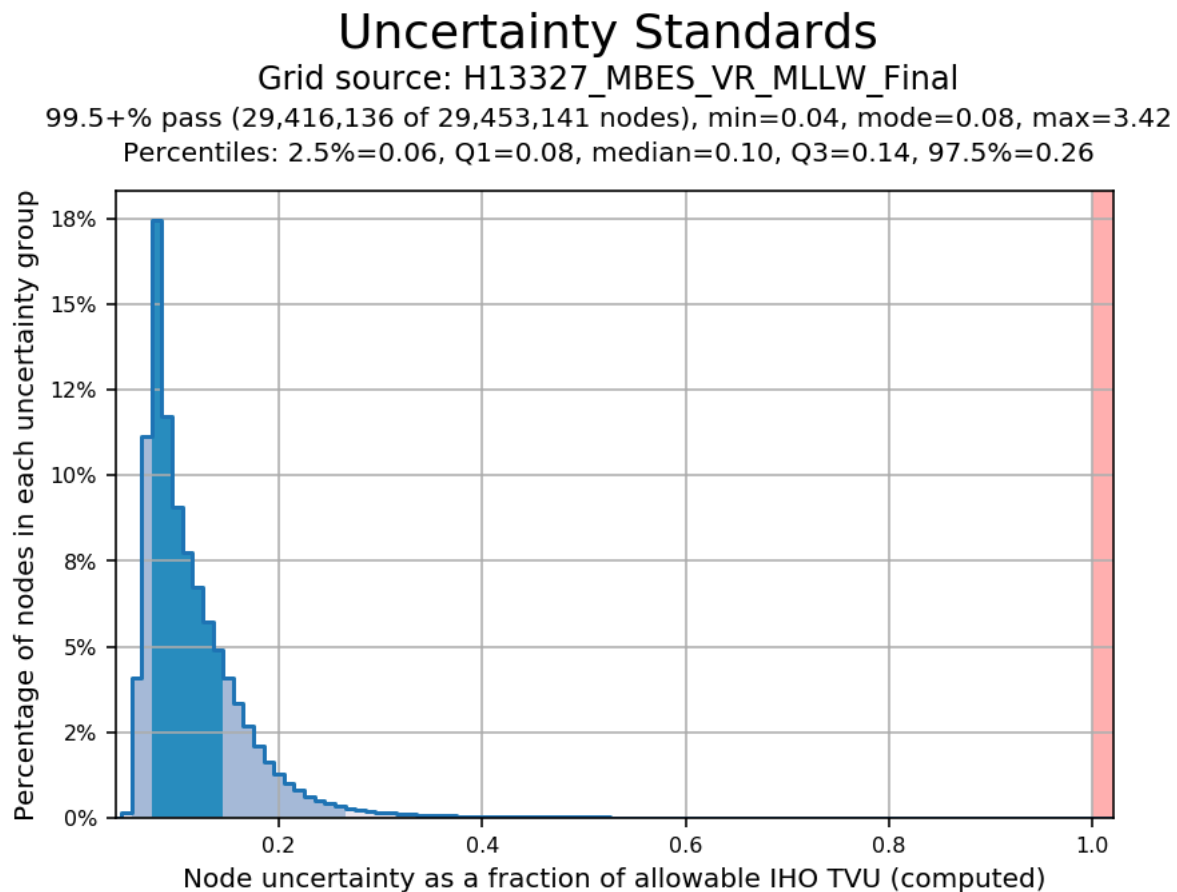


Figure 13: Survey H13327 uncertainty statistics.

B.2.3 Junctions

Four contemporary surveys junction with survey H13327 (Figure 14). The following junctions were made with this survey (Table 9):

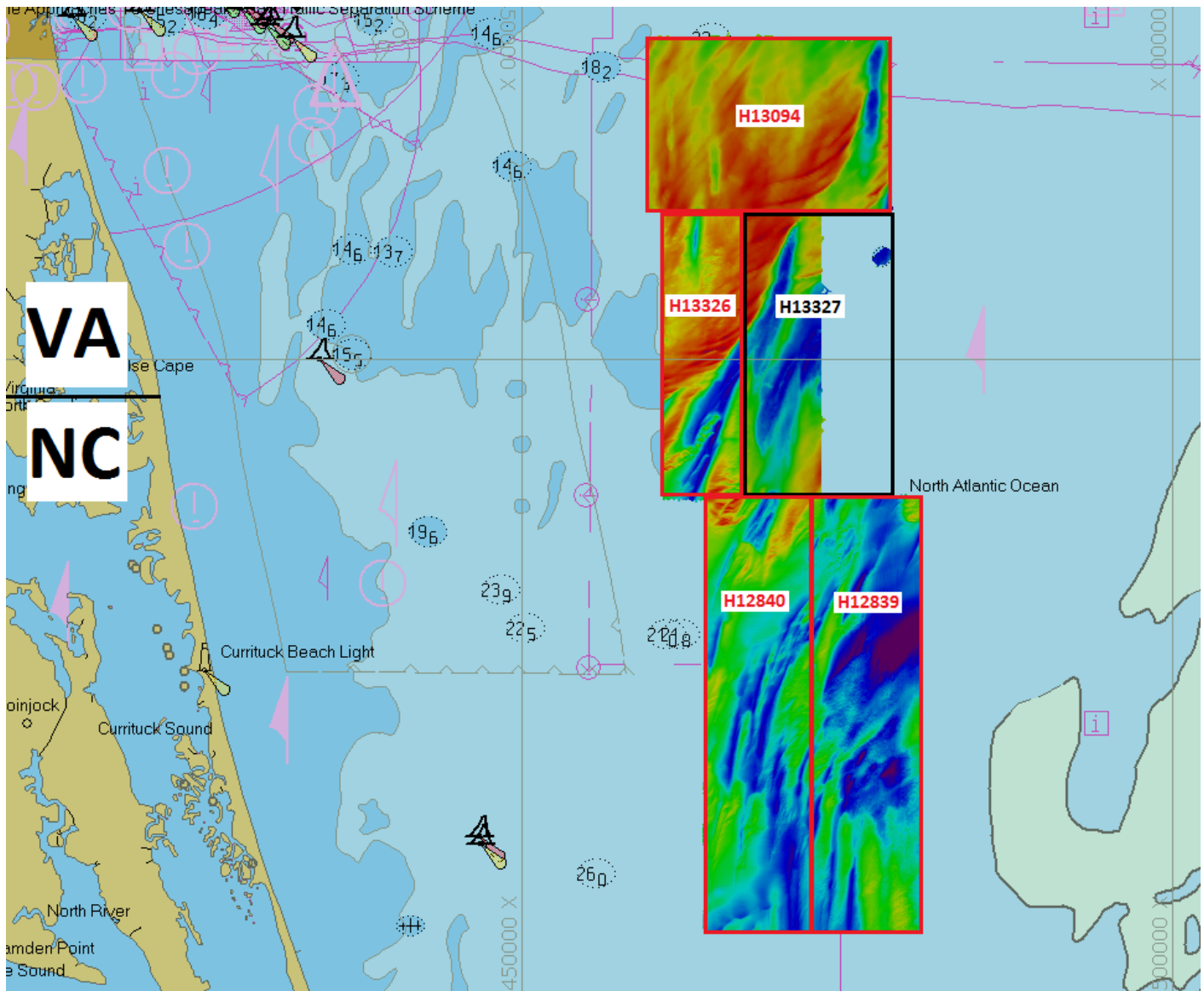


Figure 14: Survey H13327 limits outlined in black surrounded by all four junctioning surveys outlined in red, plotted over ENC US3DE01M.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12839	1:40000	2015	NOAA Ship FERDINAND R. HASSLER	SE
H12840	1:40000	2015	NOAA Ship FERDINAND R. HASSLER	S
H13094	1:40000	2018	NOAA Ship FERDINAND R. HASSLER	N
H13326	1:40000	2019	NOAA Ship THOMAS JEFFERSON	W

Table 9: Junctioning Surveys

H12839

The southeastern edge of survey H13327 junctioned with survey H12839 (Figure 15). A difference surface comparison was conducted in accordance with procedures outlined in the DAPR. The difference between surveys H13327 and H12839 ranged from -0.69m to 0.85m. The mean was -0.005m and the standard deviation 0.21m (Figure 16). Significant differences between surface nodes were located over highly dynamic areas of the sea floor (Figure 17).

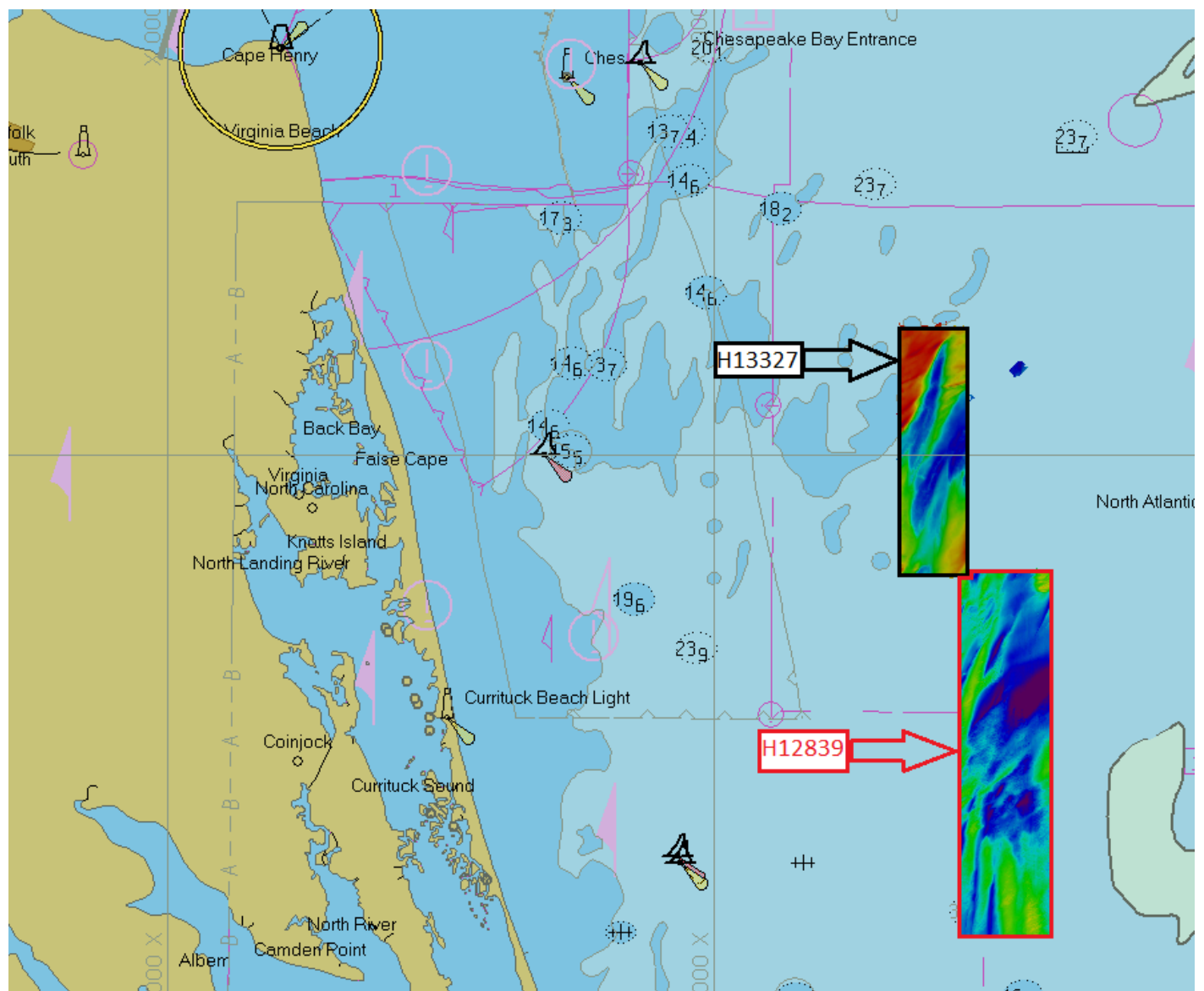


Figure 15: Survey H12839 junctions on the southeastern edge of H13327.

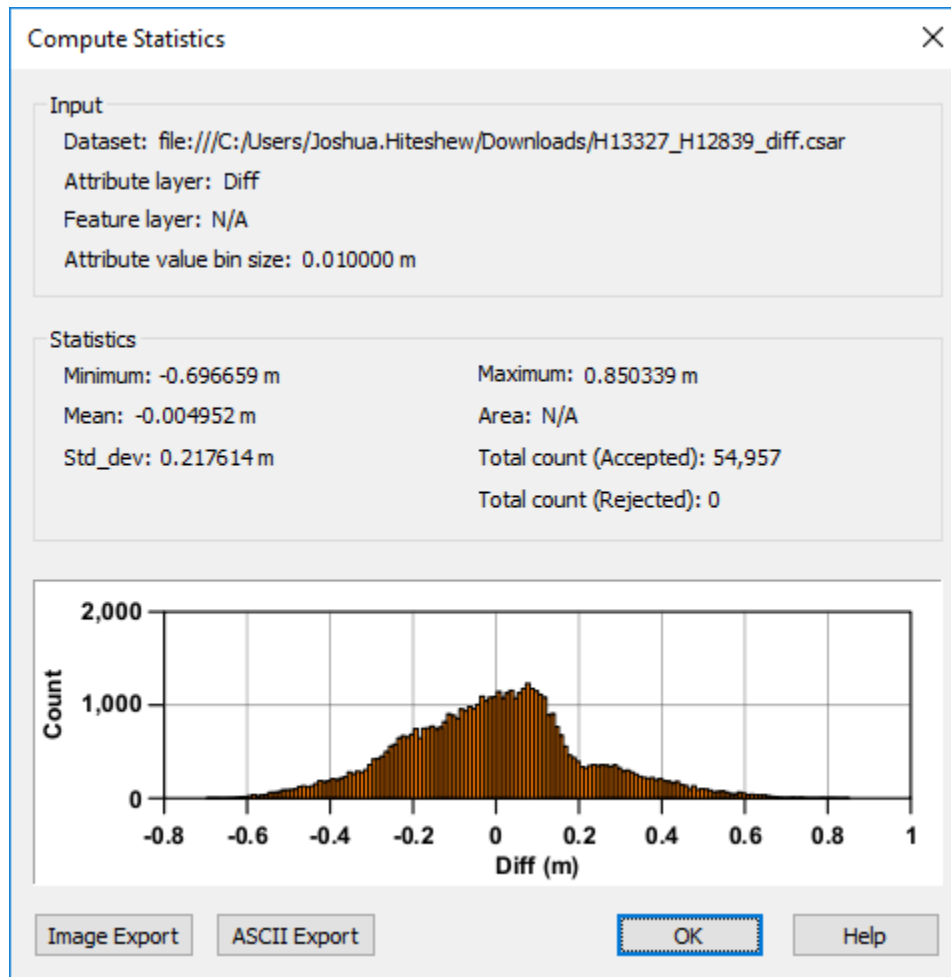


Figure 16: Survey H13327 and H12839 difference surface comparison statistics.

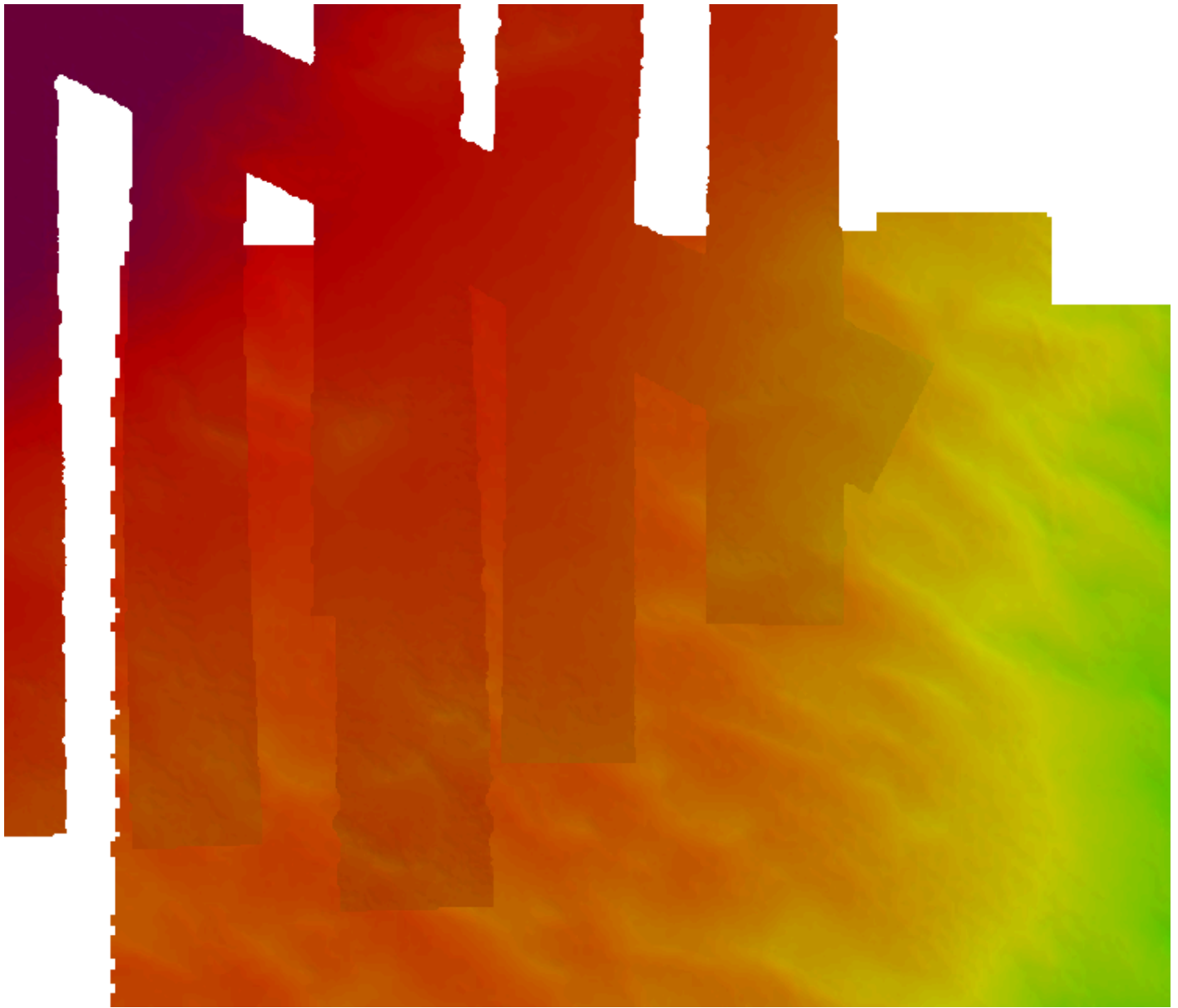


Figure 17: Survey H12839 junction dynamic sea floor.

H12840

The southern edge of survey H13327 junctioned with survey H12840 (Figure 18). A difference surface comparison was conducted in accordance with procedures outlined in the DAPR. The difference between surveys H13327 and H12840 ranged from -0.77m to 0.88m. The mean was 0.02m and the standard deviation 0.15m (Figure 19).

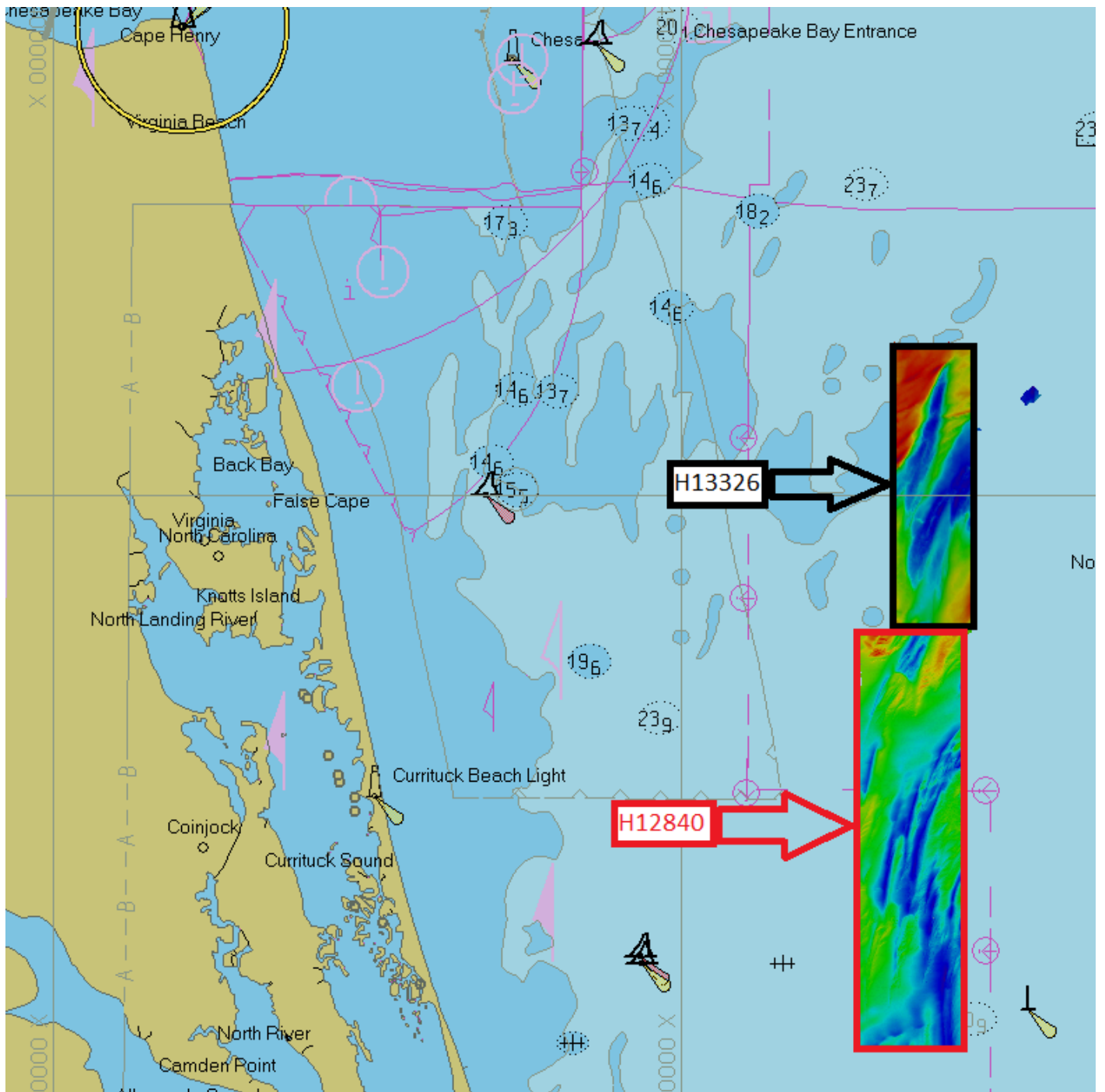


Figure 18*: H12840 junctions on the southern edge of H13327.

**Survey reference of H13326 within the image is in error and should be attributed as H13227.*

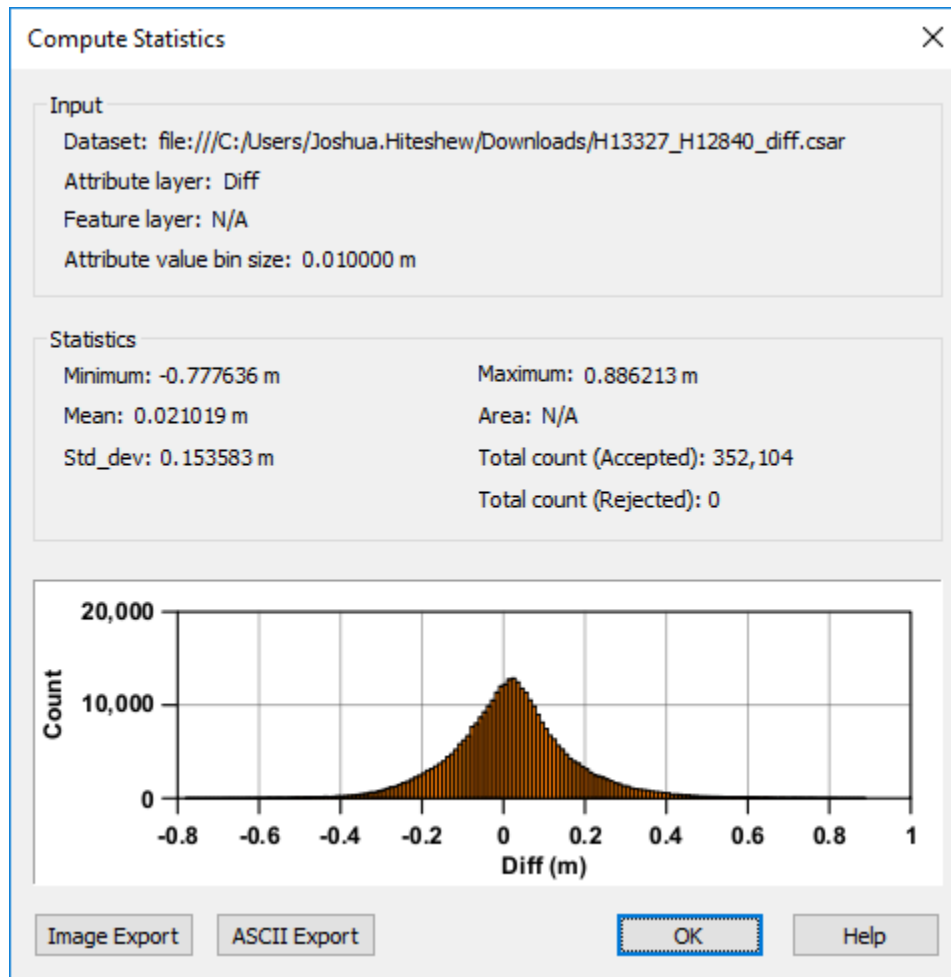


Figure 19: H13327 and H12840 difference surface comparison statistics

H13094

The northern edge of survey H13327 junctioned with survey H13094 (Figure 20). A difference surface comparison was conducted in accordance with procedures outlined in the DAPR. The difference between surveys H13327 and H13094 ranged from -0.58m to 0.88m. The mean was 0.05m and the standard deviation 0.08m (Figure 21).

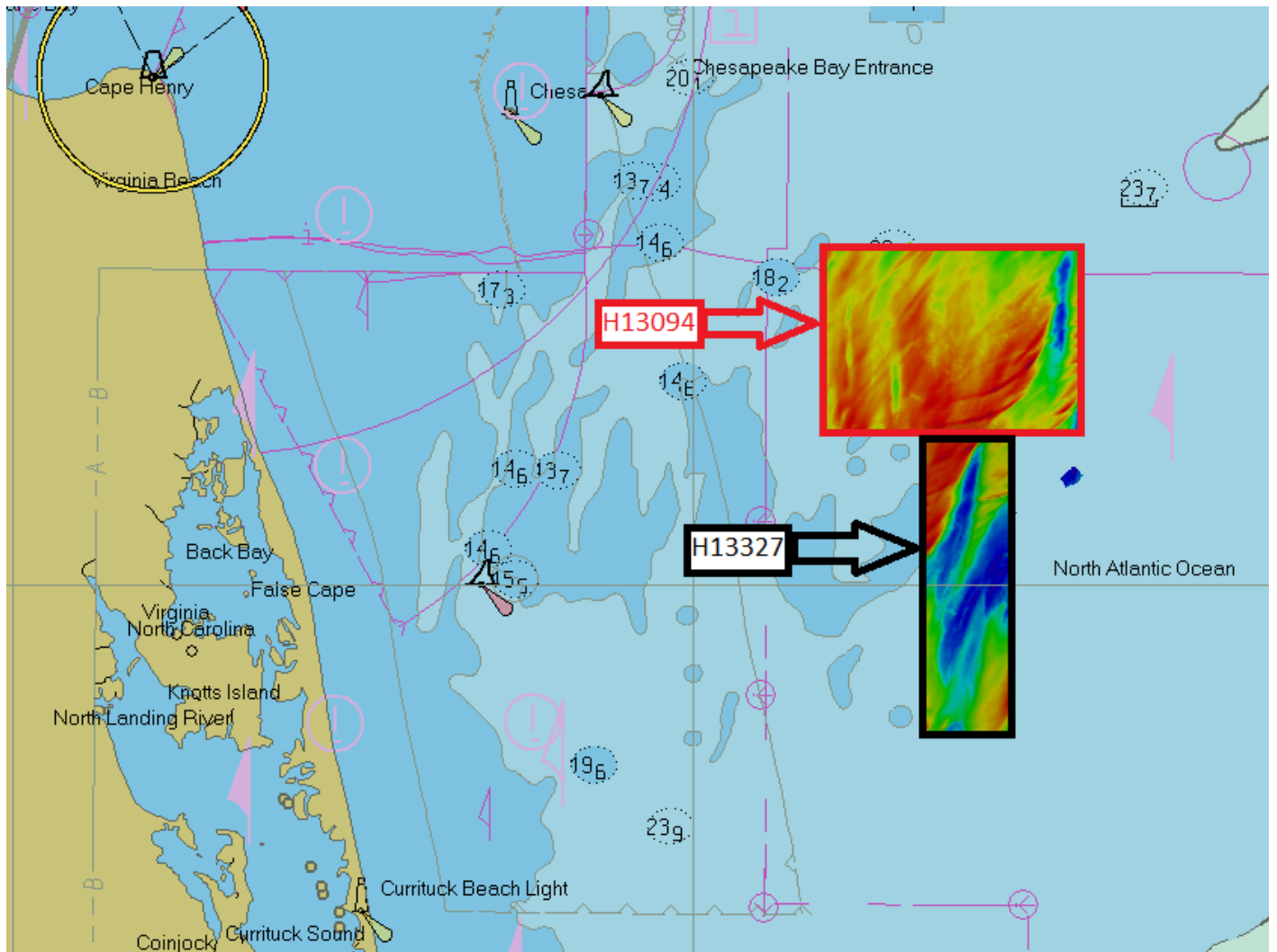


Figure 20: H13094 junctions on the northern edge of H13327.

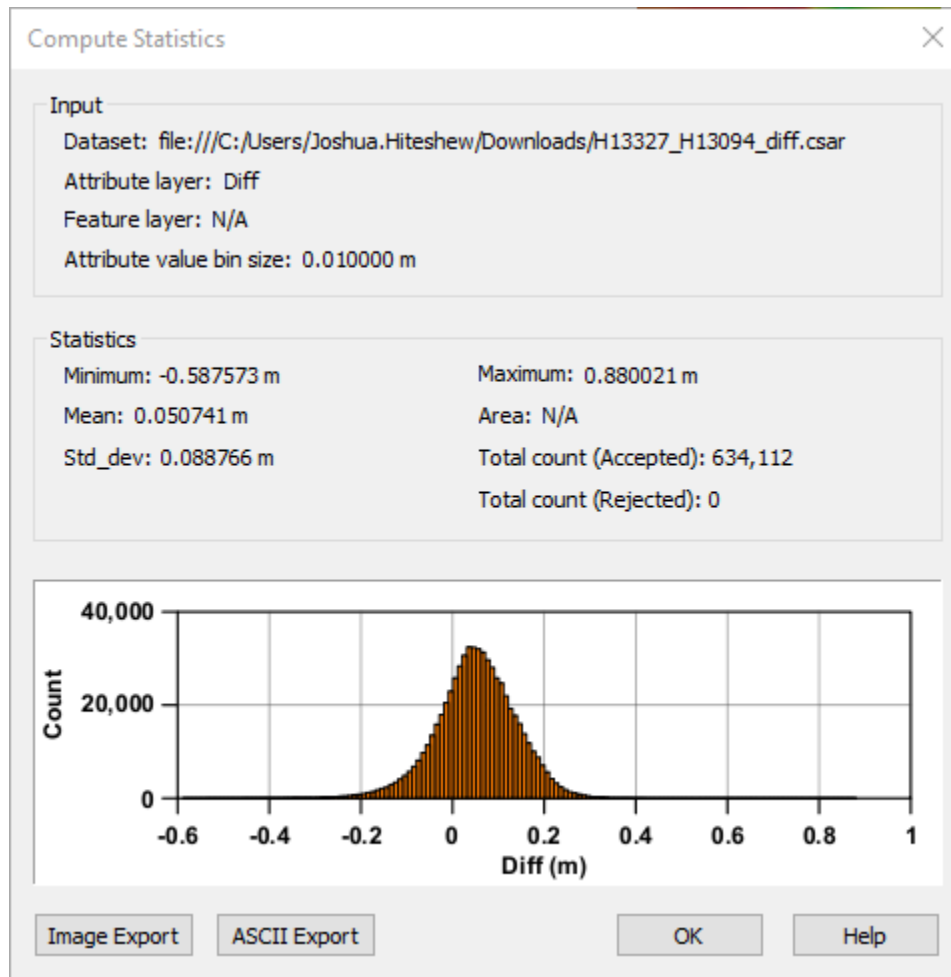


Figure 21: H13327 and H13094 difference surface comparison statistics.

H13326

The western edge of survey H13327 junctioned with survey H13326 (Figure 22). A difference surface comparison was conducted in accordance with procedures outlined in the DAPR. The difference between surveys H13327 and H13326 ranged from -0.79m to 0.68m. The mean was 0.04m and the standard deviation 0.05m (Figure 23).

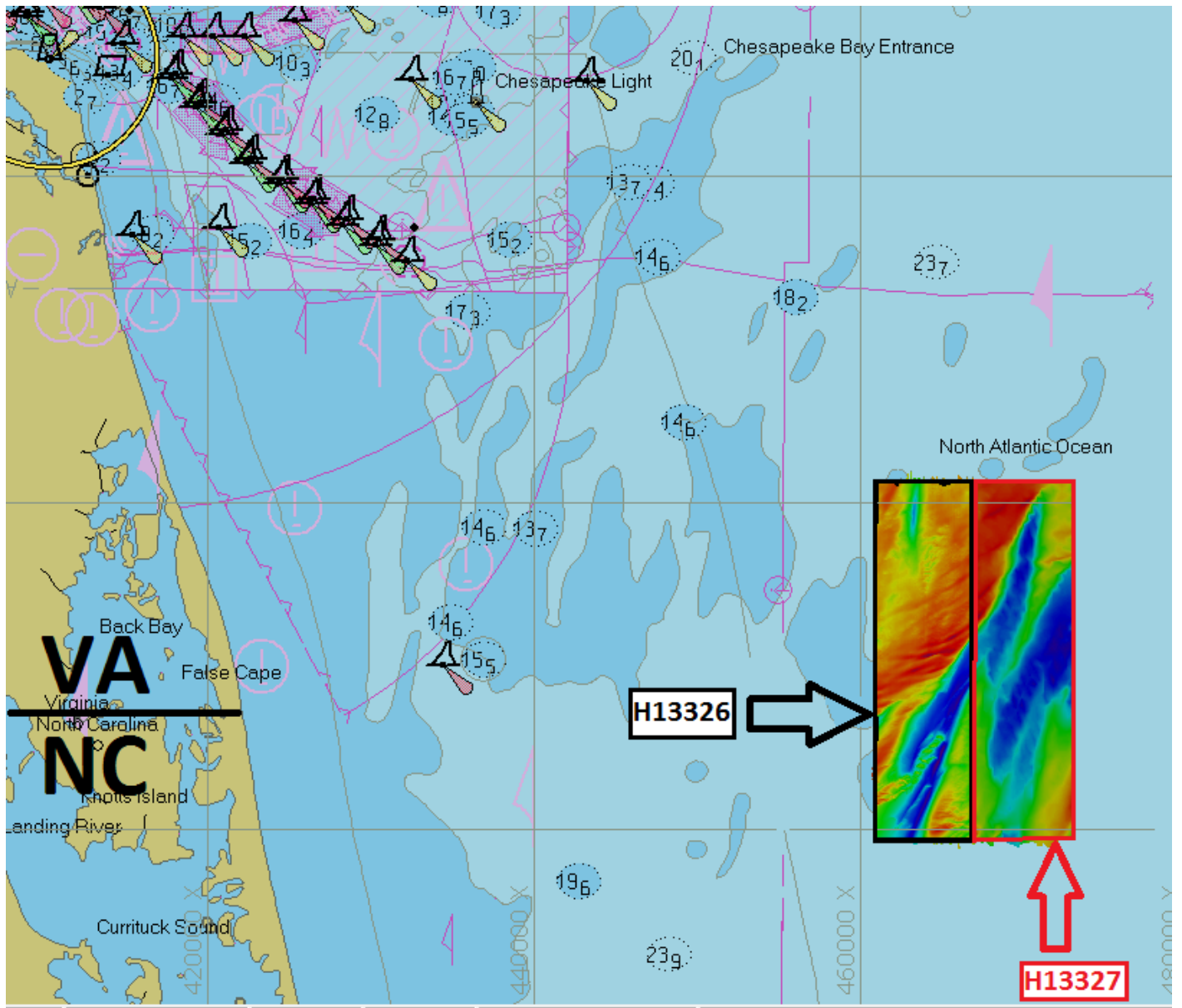


Figure 22: H13326 junctions on the western edge of H13327.

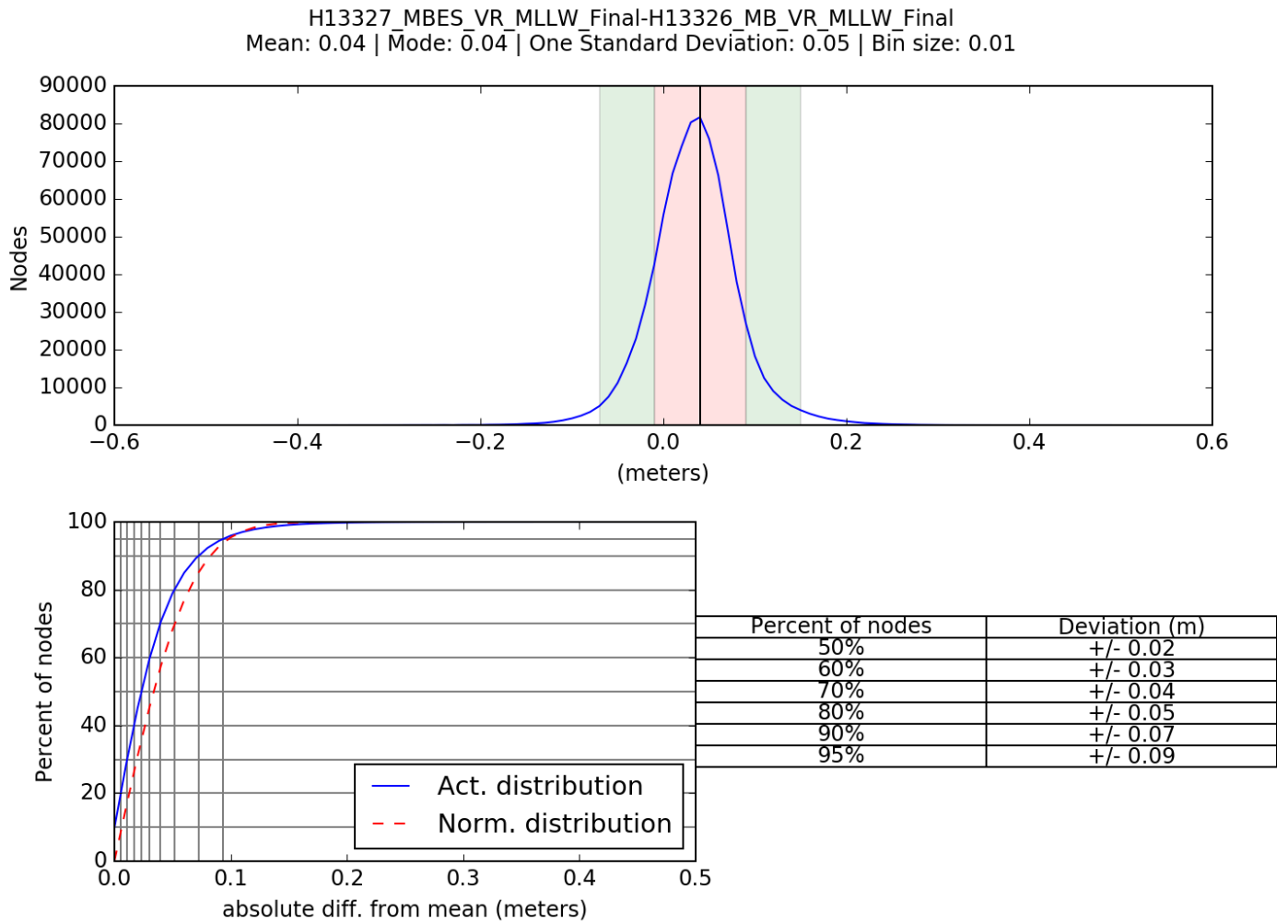


Figure 23: H13327 and H13326 difference surface comparison statistics.

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

Side scan data gaps

See section A.4 Survey Coverage.

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were conducted at the start of acquisition day, and within four hours of each previous. Sound speed profiles were acquired from S222 in accordance with HSSD 2019 standards using a Rolls Royce Brooke Ocean Moving Vessel Profiler (MVP) 100. MVP casts were conducted from S222 approximately twice an hour. Sound speed was monitored by the survey watch to assess sound speed variation in the water column and conduct casts accordingly.

S222 data were corrected by applying sound speed profiles nearest in distance in time (4 hours). All sound speed profile data were concatenated into a master file. A total of 116 sound speed measurements were collected within the survey limits of ~~H13326~~ **H13327** with six additional measurements collected outside the data extents (Figure 24). All six of these outside measurements provide data representative of the conditions found within the survey area and are appropriate for use.

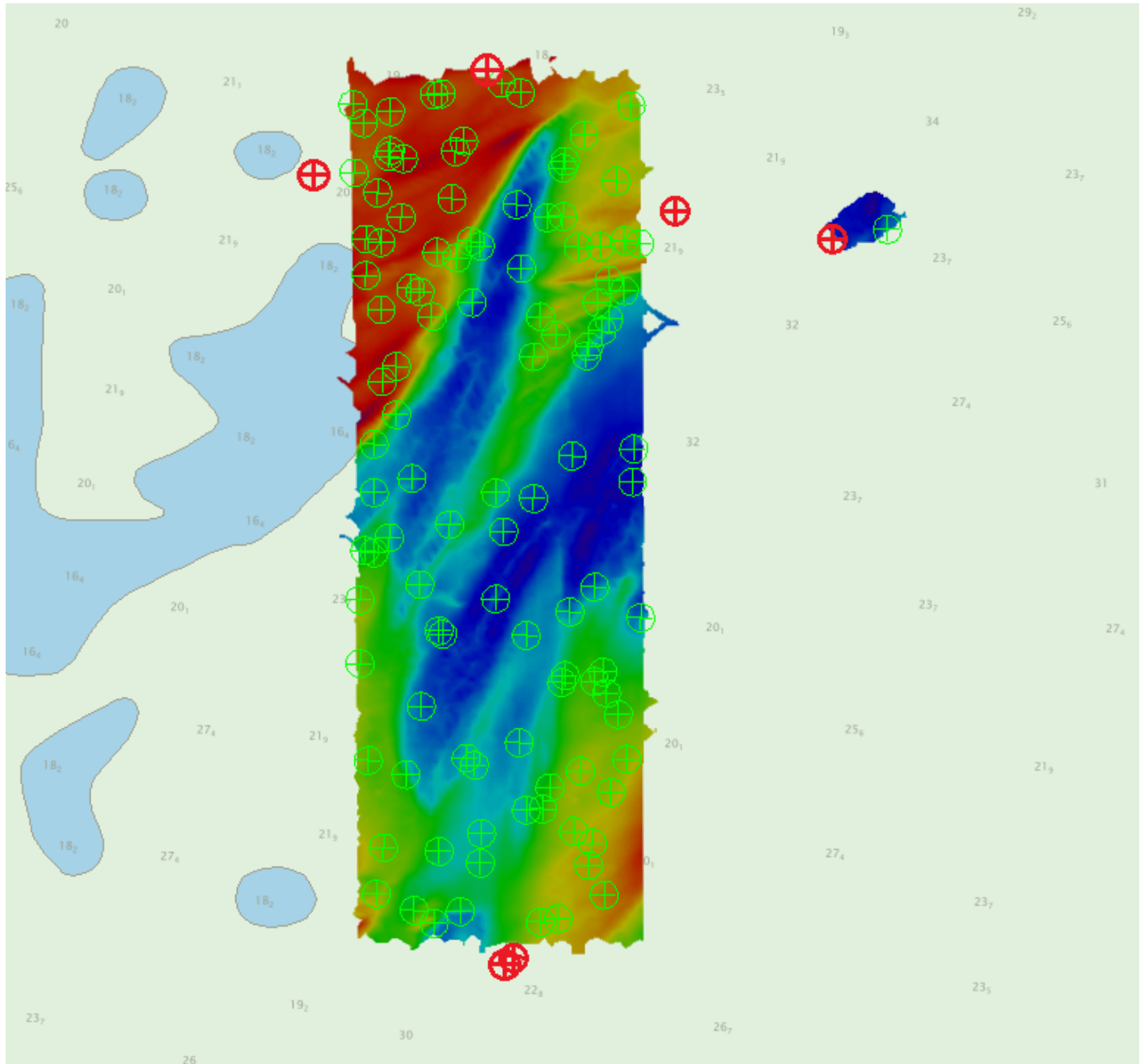


Figure 24: Overview of all SVP casts taken on H13327. The six casts located outside survey limits are highlighted in red.

B.2.8 Coverage Equipment and Methods

S222 acquired 100% side scan sonar coverage with concurrent multibeam to meet complete coverage requirements on survey H13327, as specified in the project instructions, using a Klein 5000V1 towfish and a Kongsberg EM2040 multibeam system.

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

All equipment and survey methods were used as detailed in the DAPR. Raw MBES backscatter was logged as part of the .all file of Kongsberg EM2040 system. Backscatter was processed in QPS Fledermaus GeoCoder Toolbox(FMGT) software and the exported geotiffs are included in the final processed data package. Multibeam acoustic backscatter (MBAB) holidays were observed within data acquired on day 11/21/2019 (Figures 25-29).

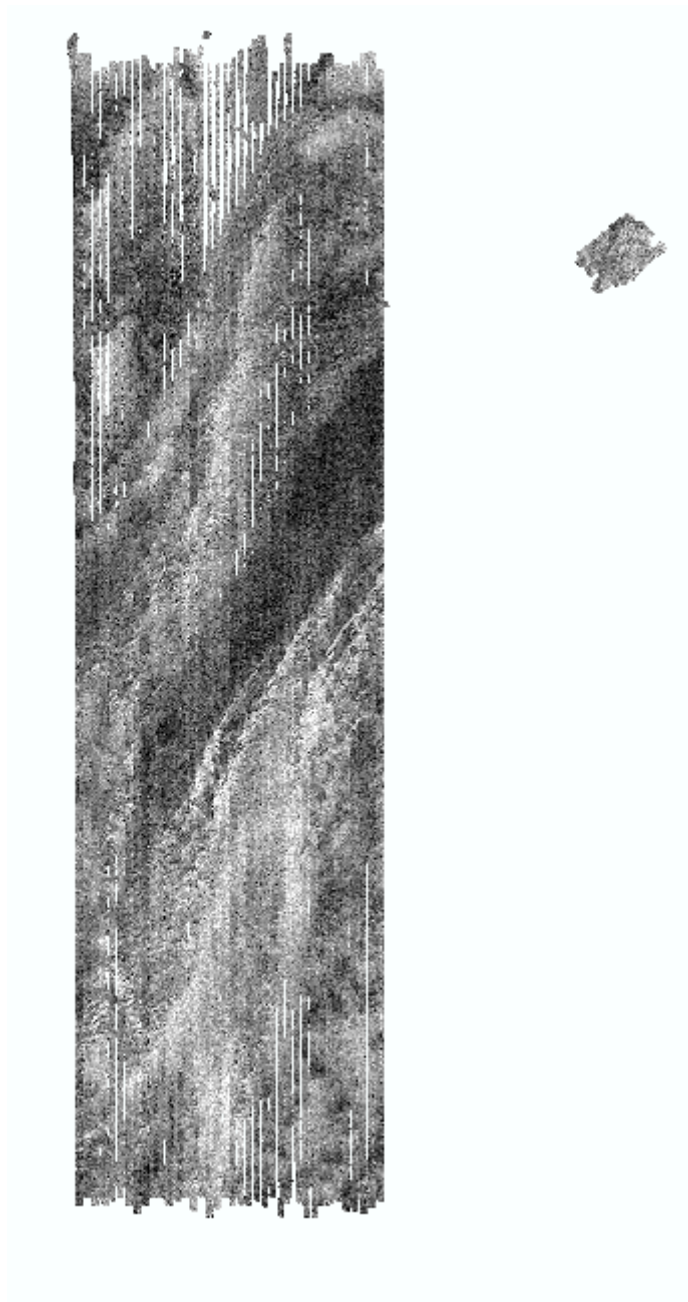


Figure 25: S222's 300kHz multibeam acoustic backscatter at 1m resolution.



Figure 26: S222's multibeam acoustic backscatter holiday on line 0136_20191121_041904_S222_EM2040 on Julian day number 325. Approximate location of 36° 41' 47.85"N, 75° 19' 10.32"W.

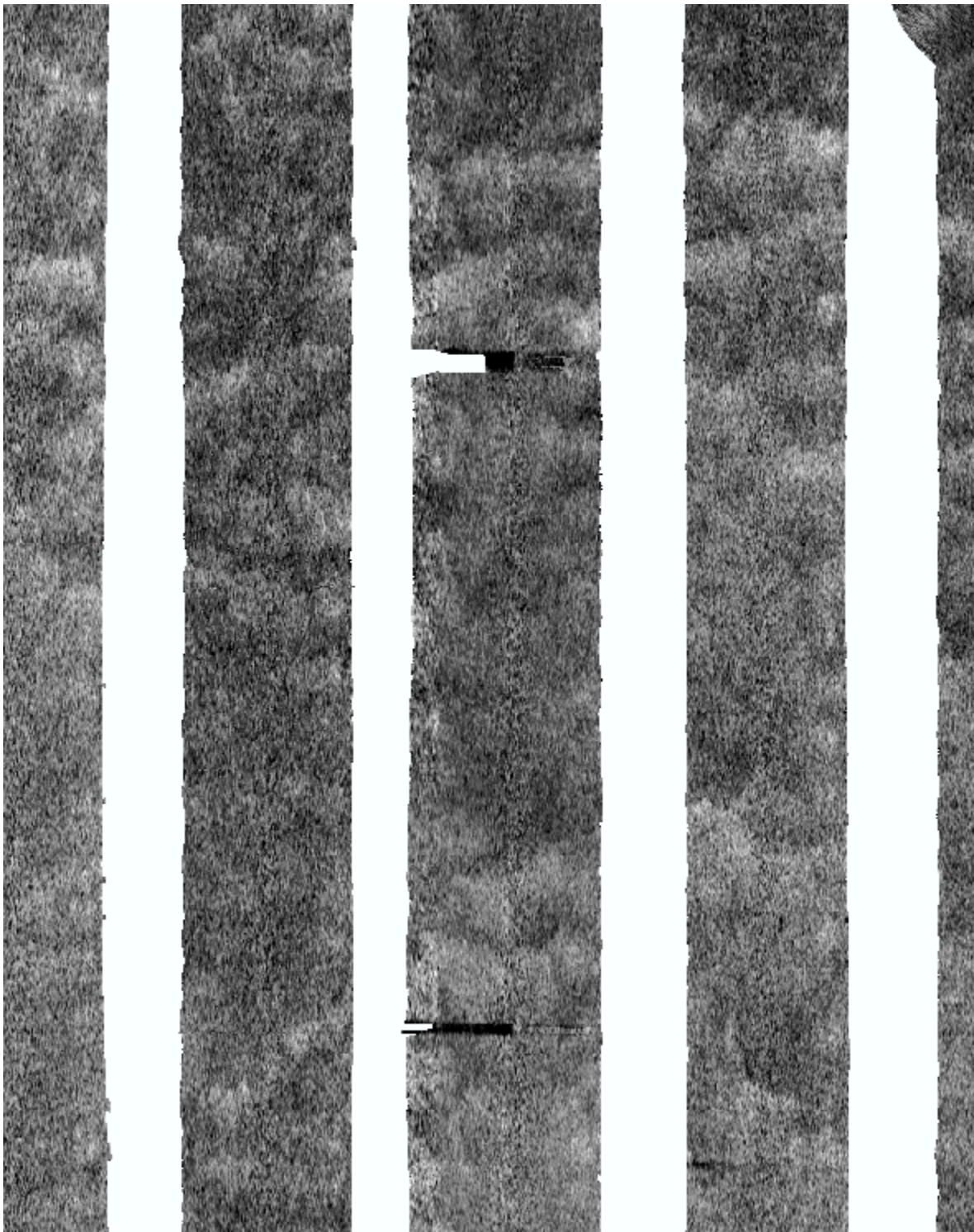


Figure 27: S222's multibeam acoustic backscatter holiday on line 0127_20191121_014801_S222_EM2040 on Julian day number 325. Approximate location of 36° 40' 9.47"N, 75° 19' 16.44"W.

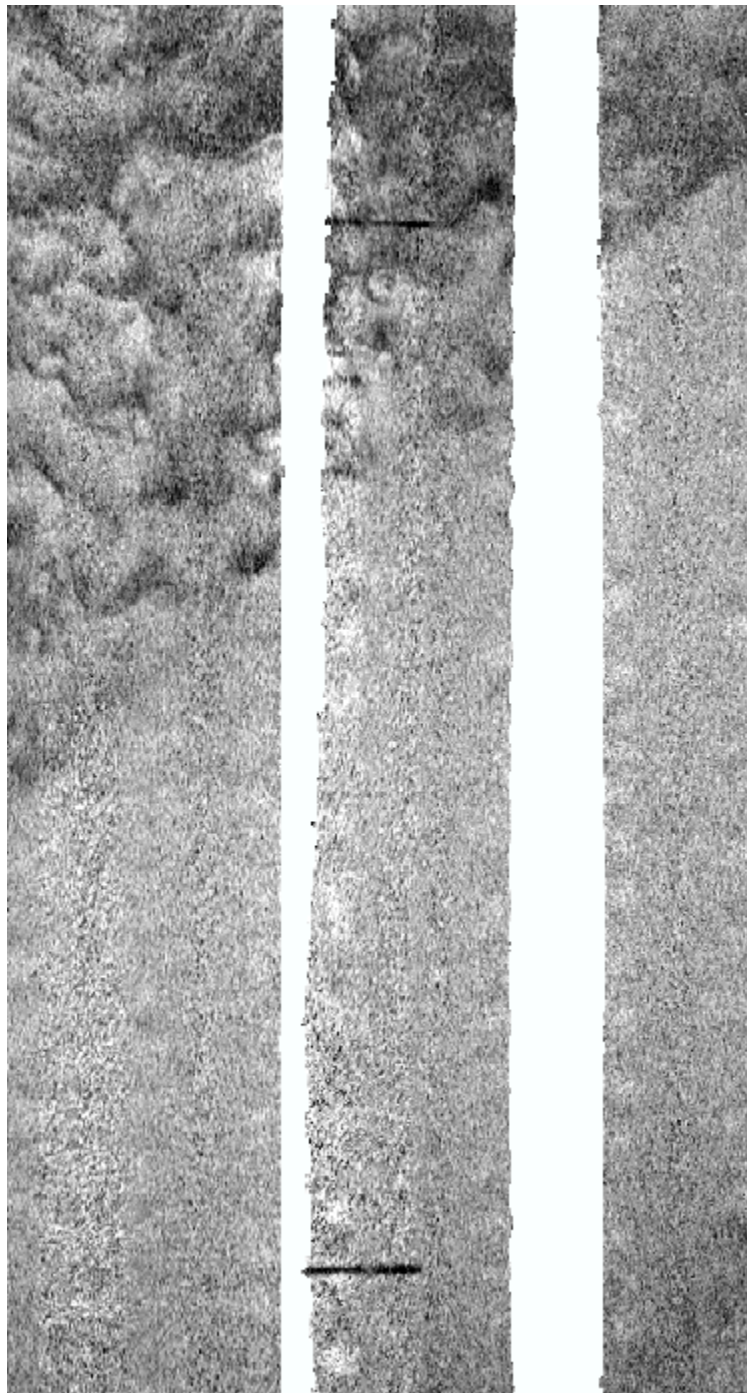


Figure 28: S222's multibeam acoustic backscatter holiday on line 0133_20191121_031058_S222_EM2040 on Julian day number 325. Approximate location of 36° 41' 2.07"N, 75° 18' 58.27"W.

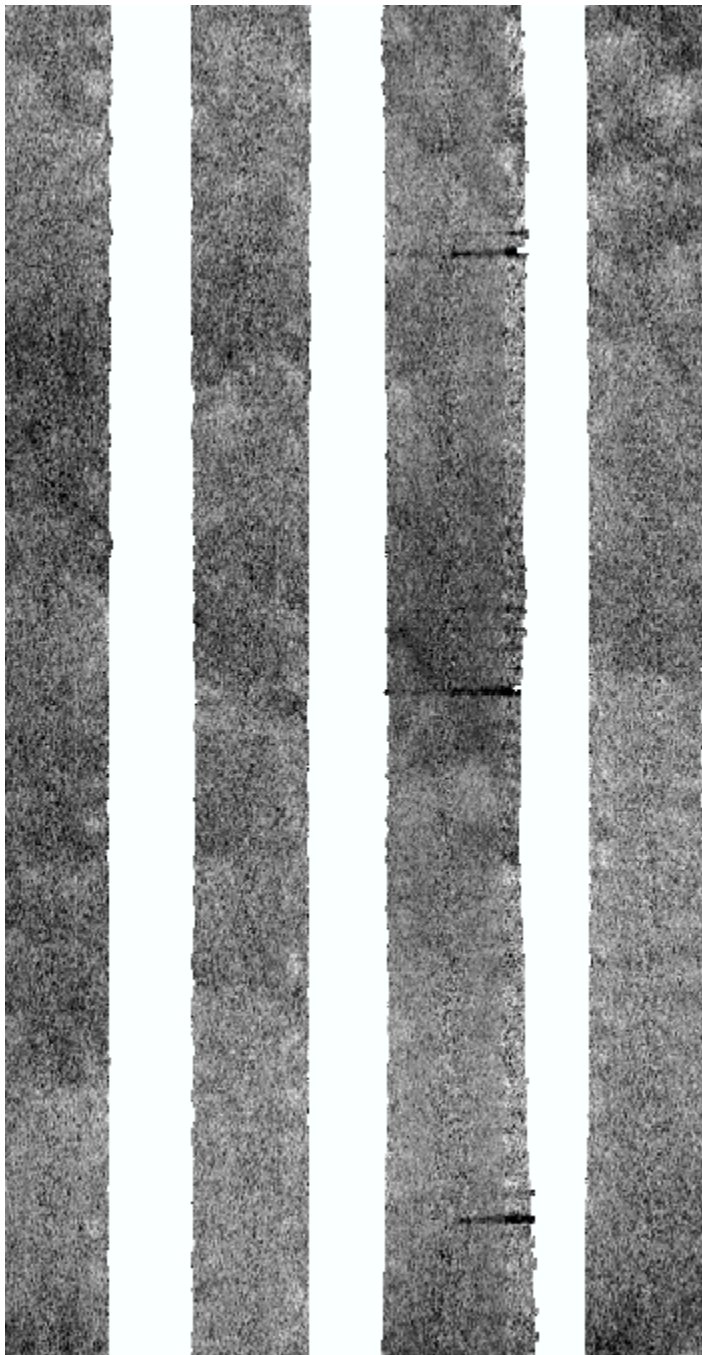


Figure 29: S222's multibeam acoustic backscatter holiday on line 0131_20191121_024252_S222_EM2040 on Julian day number 325. Approximate location of 36° 40' 8.81"N, 75° 18' 22.23"W.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following Feature Object Catalog was used: NOAA Profile Version 2019.

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
H13327_MBES_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	18.4 meters - 38.1 meters	NOAA_VR	Complete MBES
H13327_MBES_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution	18.4 meters - 38.1 meters	NOAA_VR	Complete MBES
H13327_SSSAB_1m_455kHz_1of1	SSS Mosaic	1 meters	-	N/A	100% SSS
H13327_MBAB_1S222_300kHz_1of1	MB Backscatter Mosaic	1 meters	-	N/A	MBES Backscatter

Table 10: Submitted Surfaces

Complete coverage requirements were met by 100% Side scan sonar coverage with concurrent multibeam as specified under section 5.2.2.3 of the HSSD 2019. All bathymetric grids for H13327 meet density requirements per the HSSD 2019 (Figure 30). See section A.4 Survey Coverage for a complete discussion on side scan coverage.

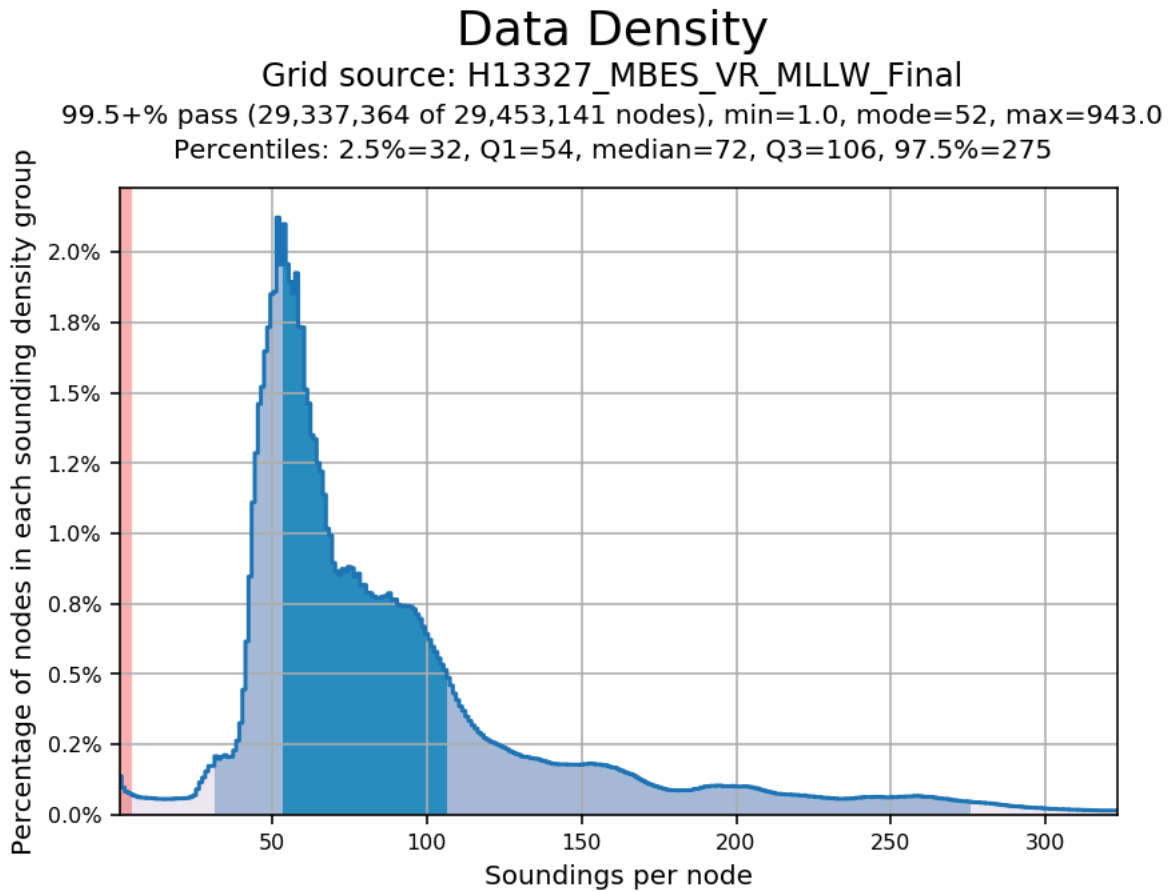


Figure 30: H13327 density statistics.

C. Vertical and Horizontal Control

No Horizontal and Vertical Control Report (HVCR) is required for this survey.

C.1 Vertical Control

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

ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	OPR_D304_TJ_19_VDatum_100m_NAD83- MLLW_geoid12b.csar

Table 11: ERS method and SEP file

All soundings submitted for H13327 are reduced to MLLW using VDatum techniques as outlined in the DAPR.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD 83).

The projection used for this project is Universal Transverse Mercator (UTM) Zone 18.

PPP

Trimble-RTX service was used with an Applanix POS MVv5 GNSS_INS system to obtain highly accurate ellipsoidally referenced position data to meet ERS specifications for H13327 MBES data.

WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control during data acquisition.

D. Results and Recommendations

D.1 Chart Comparison

A chart comparison was conducted between survey H13327 and previously charted ENC US3DE01M in accordance with methods outlined in the DAPR.

D.1.1 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3DE01M	1:419707	22	07/10/2019	07/10/2019	NO

Table 12: Largest Scale ENC's

US3DE01M

Sounding sets derived from H13327's bathymetric surfaces generally agreed with soundings from ENC USDE01M. However, one area in the middle of the sheet indicates shoaling with soundings two to five meters shoaler than charted being observed (Figures 31-33). No DTONS were identified.

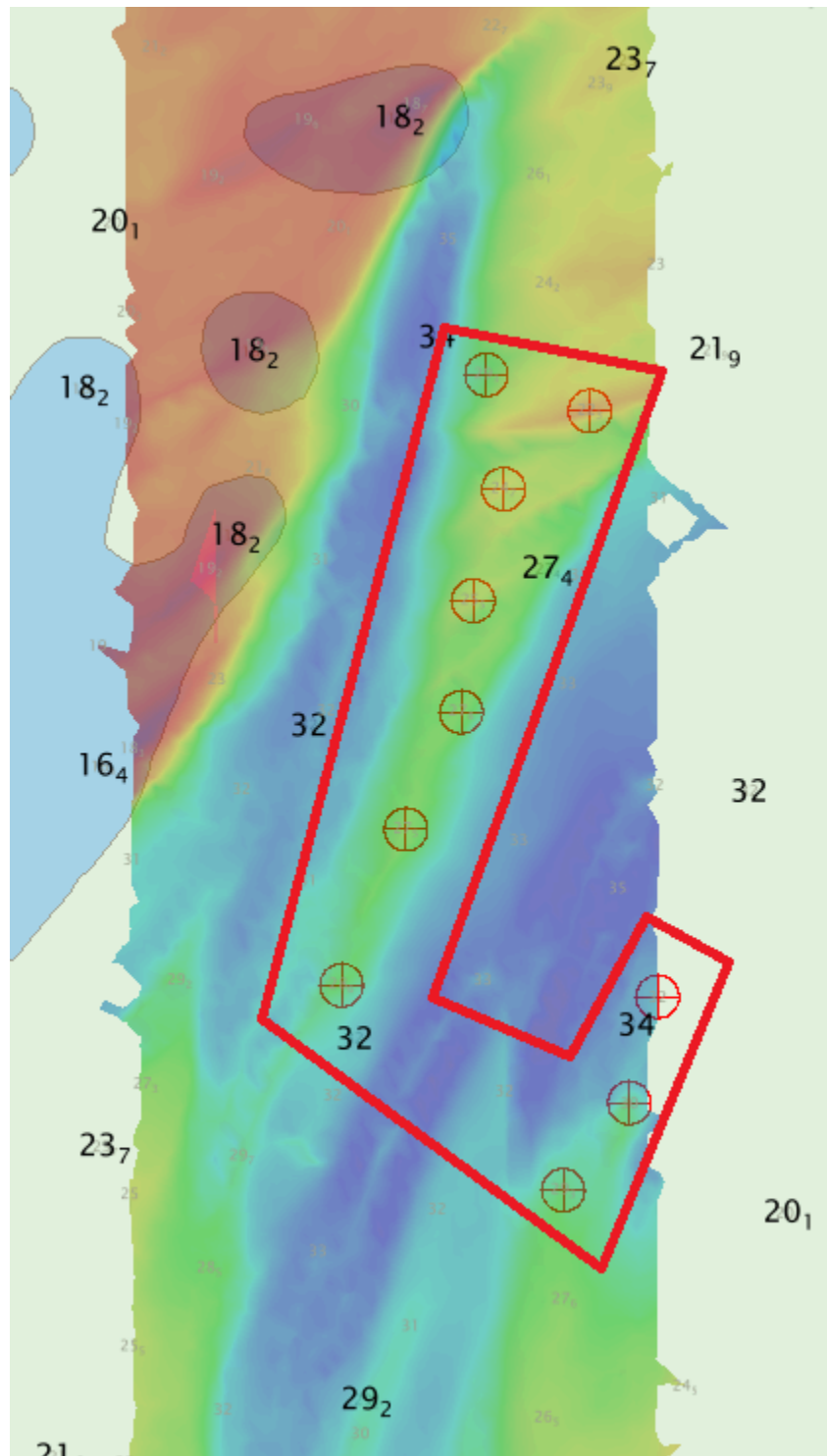


Figure 31: Overview of H13327, overlaid on ENC US3DE01M. Black numbers represent charted depths on ENC US3DE01M. The ten targets inside the red polygon highlight the area where a chart discrepancy was identified.

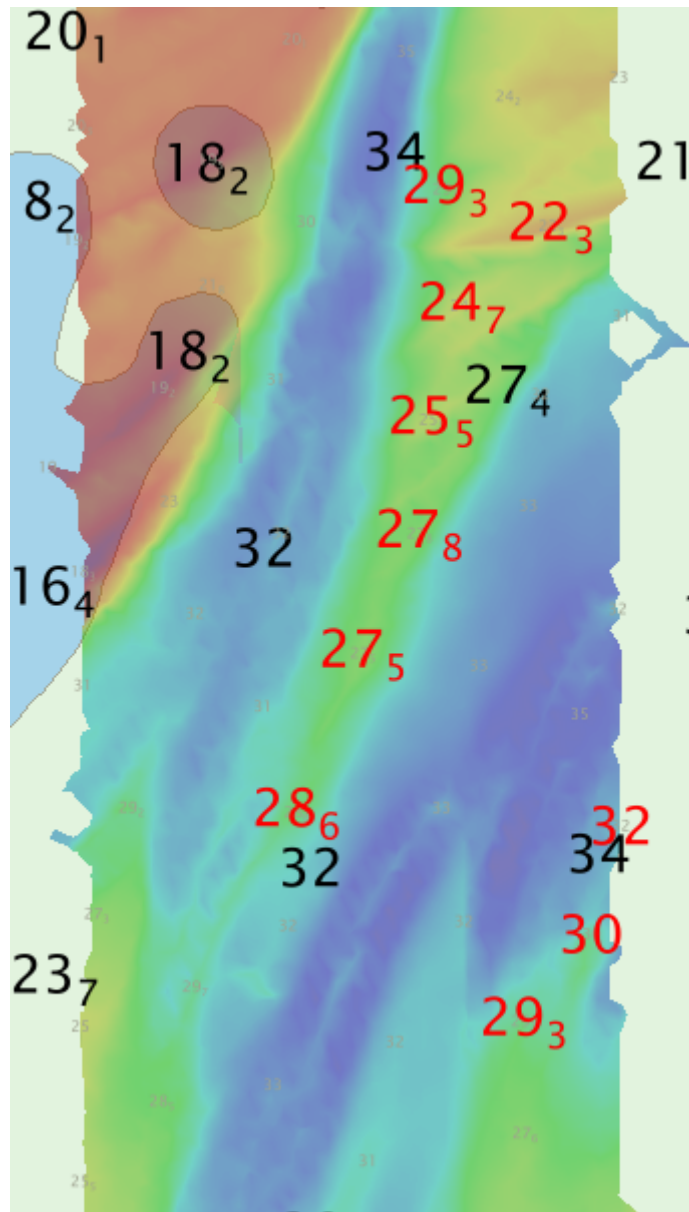


Figure 33: Image of shoaling that was observed within the data for survey H13327, overlaid on ENC US3DE01M.

D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.3 Charted Features

One charted Position Approximate Obstruction was assigned, investigated, disproved, and is included in the Final Feature File. This PA Obstruction was disproved by complete coverage multibeam with a 480m search radius extending from the center of it's charted location (Figure 34-35). Nothing significant was located while conducting the 480m search radius. The hydrographer recommends deleting PA Obstruction from ENC US3DE01M.

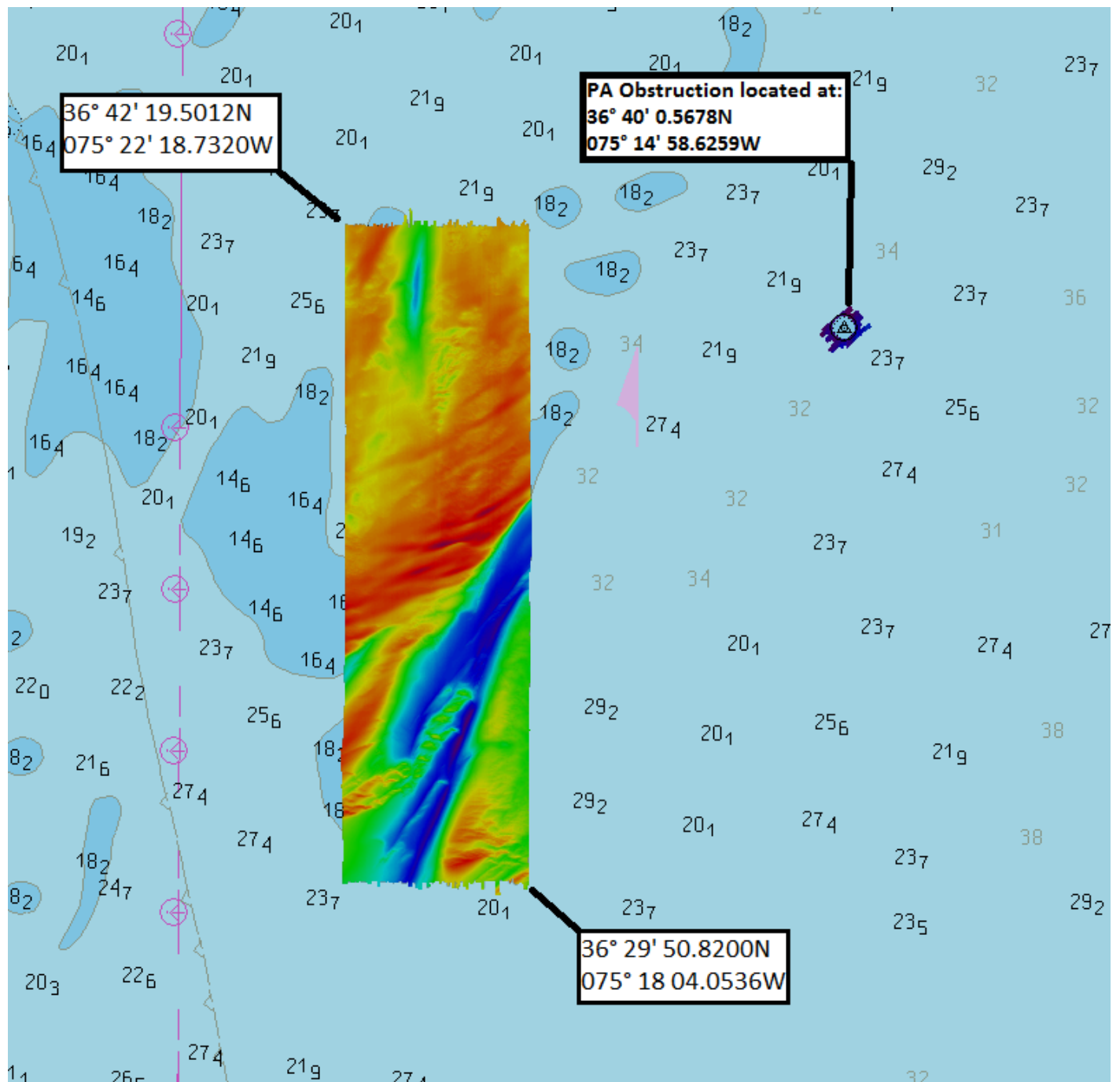


Figure 34: General location of the PA obstruction located East of mainscheme data for survey H13327.

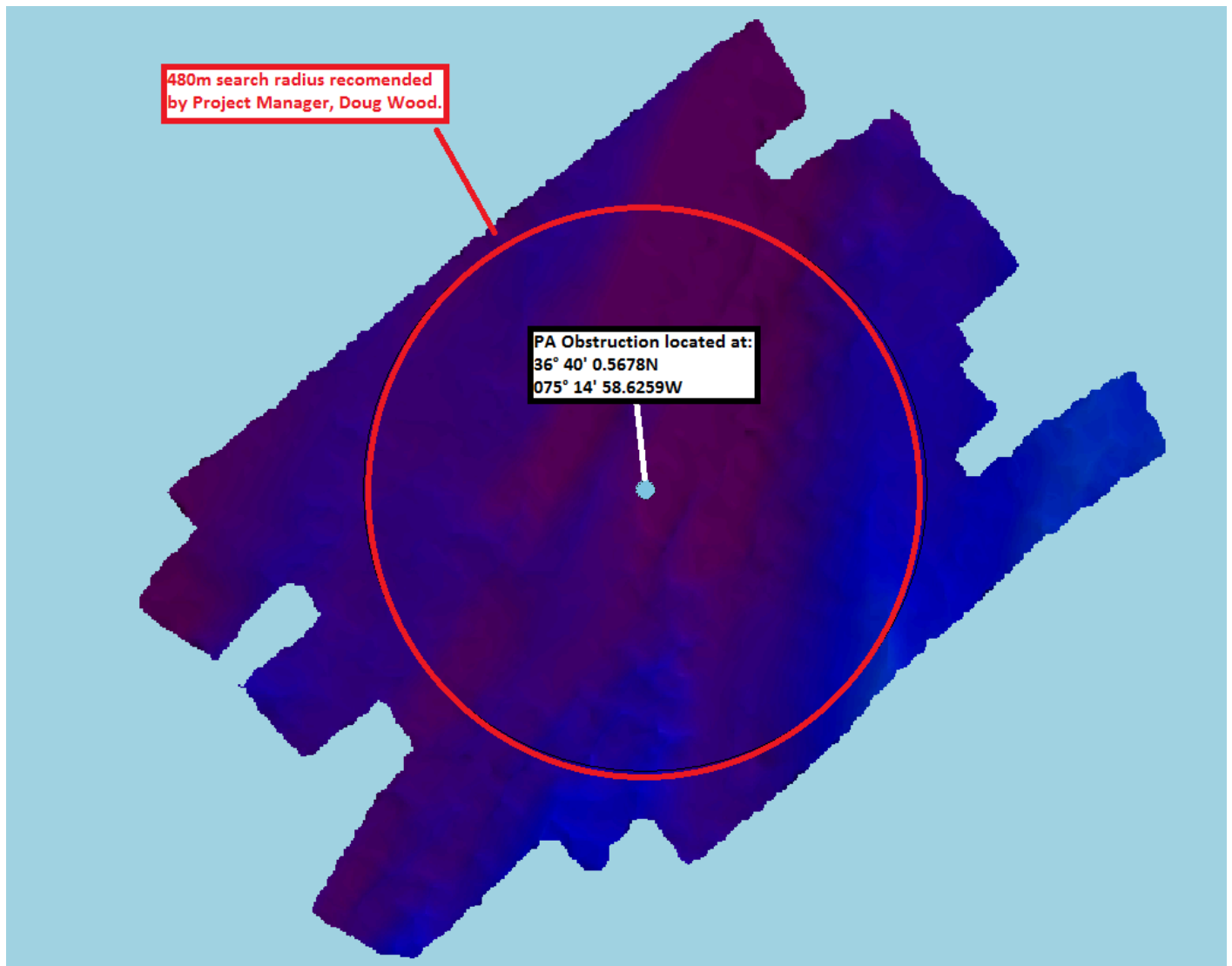


Figure 35: Closer view of PA wreck within H13327 sheet limits, with red circle representing the 480m search radius.

D.1.4 Uncharted Features

No uncharted features exist for this survey.

D.1.5 Shoal and Hazardous Features

A shoal is present in the middle of H13327 (See section D.1.1). No DTONS were identified.

D.1.6 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.1.7 Bottom Samples

Bottom samples were assigned, investigated, and are included in the Final Feature File. See Figure 36 for a generalized view of H13327's bottom sample locations.

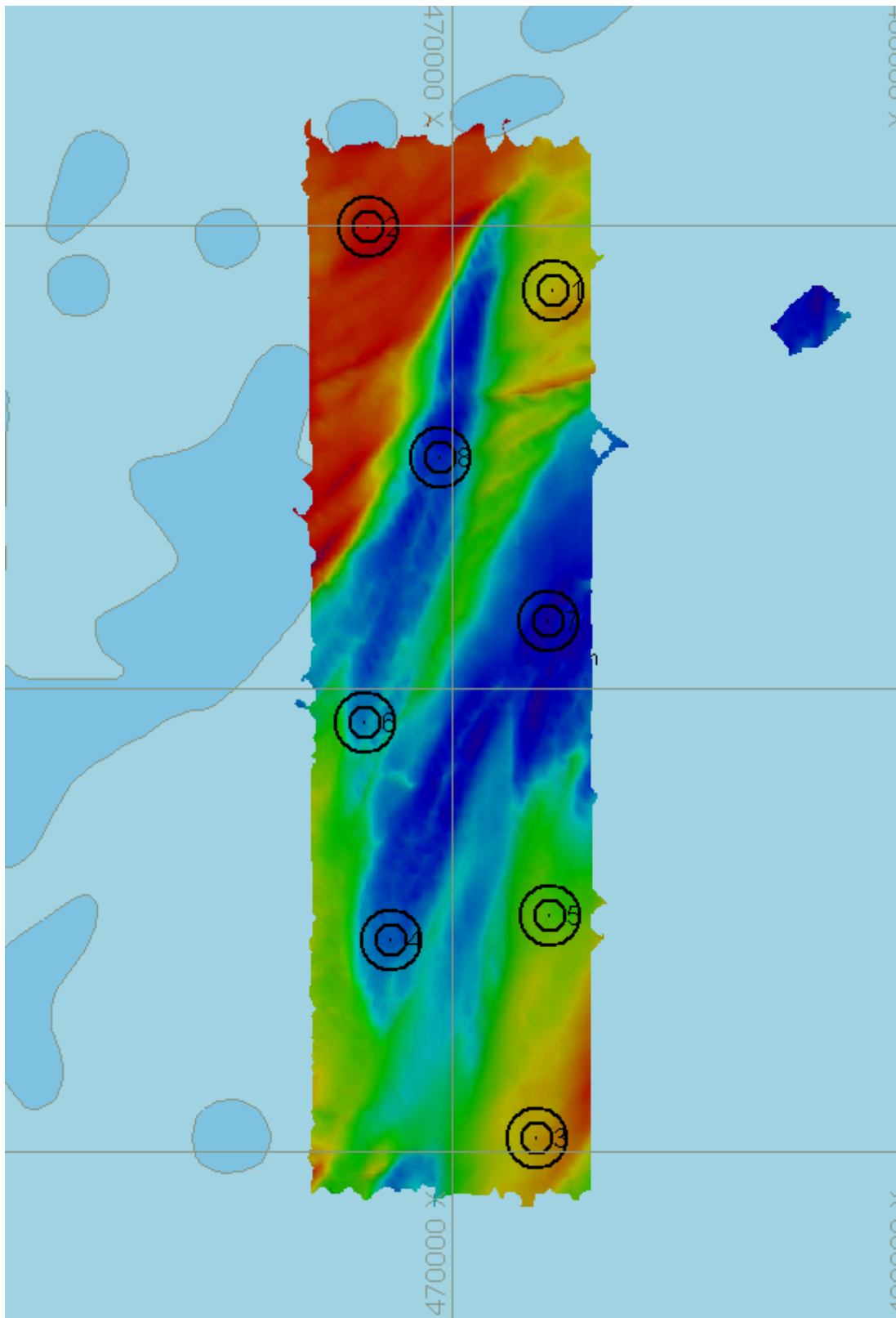


Figure 36: General location of bottom samples investigated within the sheet limits of H13327.

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 Aids to Navigation

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

D.2.3 Overhead Features

No overhead features exist for this survey.

D.2.4 Submarine Features

No submarine features exist for this survey.

D.2.5 Platforms

No platforms exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Abnormal Seafloor and/or Environmental Conditions

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

D.2.8 Construction and Dredging

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

D.2.9 New Survey Recommendation

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

D.2.10 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 Specifications and Deliverables, 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 Briana Hillstrom, NOAA	Commanding Officer/ Chief of Party	03/25/2020	HILLSTROM.BRIANA.WELTON.1267667531 Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531 Date: 2020.03.25 12:21:04 -04'00'
LT Calandria DeCastro, NOAA	Field Operations Officer	03/25/2020	DECASTRO.CALANDRIA.MALVINA.1468902156 Digitally signed by DECASTRO.CALANDRIA.MALVINA.1468902156 Date: 2020.03.25 14:08:08 -04'00'
Joshua Hiteshew	Chief Hydrographic Survey Technician	03/25/2020	HITESHEW.JOSHUA.TAYLOR.1537939652 Digitally signed by HITESHEW.JOSHUA.TAYLOR.1537939652 Date: 2020.03.25 14:42:01 Z
Kevin Brown	Sheet Manager	03/25/2020	BROWN.KEVIN.WAYNE.1542797920 Digitally signed by BROWN.KEVIN.WAYNE.1542797920 Date: 2020.03.25 16:00:33 Z

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	Continuously Operating Reference Station
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
ERTDM	Ellipsoidally Referenced Tidal Datum Model
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

Acronym	Definition
HSSD	Hydrographic Survey Specifications and Deliverables
HSTB	Hydrographic Systems Technology Branch
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
MBAB	Multibeam Echosounder Acoustic Backscatter
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NALL	Navigable Area Limit Line
NTM	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
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
RTX	Real Time Extended
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
SSSAB	Side Scan Sonar Acoustic Backscatter
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total Propagated Uncertainty
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDF	Zone Definition File



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

NCEI Sound Speed Data for project OPR-D304-TJ-19

1 message

ChiefST.Thomas Jefferson - NOAA Service Account <chiefst.thomas.jefferson@noaa.gov> Mon, Apr 6, 2020 at 5:30 PM

To: NODC.submissions@noaa.gov

Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

To whom it may concern,

Please see attached sound speed data for project OPR-D304-TJ-19.

If you have any questions or concerns please let me know.

V/r,

Josh

--


CHST Joshua Hiteshew, NOAA

NOAA Ship *Thomas Jefferson*

757-647-0187 ship cell

541-867-8927 voip

808-434-2706 irridium

 **OPR-D304-TJ-19_20200406.zip**
1173K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Draft OPR-D304-KR-19 Project Instructions

1 message

Starla Robinson - NOAA Federal

Fri, Aug 2, 2019 at 2:50 PM

<Starla.Robinson@noaa.gov>

To: ChiefOps MOA - NOAA Service Account <ChiefOps.MOA@noaa.gov>, OpsMgr MOA - NOAA Service Account <DeputyOps.MOA@noaa.gov>, _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>

Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>, John Nyberg - NOAA Federal <john.nyberg@noaa.gov>, "_NOS.CO-OPS.HPT" <nos.coops.hpt@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <OPS.Thomas.Jefferson@noaa.gov>, _OMAO MOA XO Thomas Jefferson <xo.thomas.jefferson@noaa.gov>, Joshua Hiteshew - NOAA Federal <joshua.hiteshew@noaa.gov>, Edward Owens - NOAA Federal <edward.owens@noaa.gov>, Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, _NOS OCS ECC <ocs.ecc@noaa.gov>, Christiaan VanWestendorp - NOAA Federal <christiaan.vanwestendorp@noaa.gov>, Lucy Hick - NOAA Federal <lucy.hick@noaa.gov>, AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>, Tara Wallace - NOAA Federal <tara.wallace@noaa.gov>, Ryan Wartick - NOAA Federal <ryan.wartick@noaa.gov>

Attached are the draft for the *NOAA Ship Thomas Jefferson's* OPR-D304-KR-19, Approaches to Chesapeake Project Instructions. This project is draft is being sent out in an effort to give the stakeholders adequate time to comment. **This is the is the best draft we could provide given our current knowledge of the requirements and limitations of personnel.** The schedules, personnel, and newly added areas are subject to change.

Please acknowledge receipt and provide your comments to this email by August 9th. Due to current staffing, the project will be handed off to Project Manager Doug Wood and Team Lead Martha Herzog, so please ensure that they are cc-ed on all correspondence. Please contact Doug Wood if you have any questions.

Thank you,
Starla Robinson

--

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 Acquisition: [HSD Planned Hydrographic Surveys](#)

Website Planning: [OCS Survey Plans](#)

2 attachments



Draft_OPR-D304-FH-19_ApproachesToChesapeakeBay_Instructions.pdf
2278K



1-TJ-19-01_OMAO_Project_Instructions_Draft_OPR-D304-FH-19.docx
63K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Signed PI for OPR-D304-TJ-19

1 message

Douglas Wood - NOAA Federal

Tue, Nov 12, 2019 at 4:24
PM

<douglas.wood@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Hi LCDR Wisotzkey,

attached are the final, final PI but the only difference is that this copy has the signature from MOC-A.

I have updated the archive and FTP site.

Also, do you have a weekly report available yet?

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



TJ-19-04 v4.0-FINAL PI, Approaches to Chesapeake Bay.pdf

1664K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

DRIX Testing Schedule and Op Areas

2 messages

Corey Allen - NOAA Federal <corey.allen@noaa.gov> Thu, Jul 25, 2019 at 5:26 PM
To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>
Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>,
"OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>,
"richard.t.brennan" <richard.t.brennan@noaa.gov>, Starla Robinson - NOAA Federal
<Starla.Robinson@noaa.gov>, Martha Herzog <martha.herzog@noaa.gov>

Andy,

Following up from BOH. My plan, for your and TJ's concurrence, is broken down below.

9/3-4 Alongside Drix testing

9/5-20 HSRR and DRIX testing to occur in the HSRR EC areas (these are both protected and open water). Then proceed offshore to the D304-TJ working grounds for open water testing.

9/23-30 DRIX open water testing back in D304-TJ working grounds

*schedule subject to change

MOC-A is on-board with this plan, with D304-TJ instructions starting on 9/5 and accounting for the HSRR time and DRIX inshore testing time.

Images of the HSRR and D304 draft project areas attached, polygons also attached in shp format.

Corey

--

J. Corey Allen

Chief, Operations Branch

[Office of Coast Survey, NOAA](#)

Corey.Allen@noaa.gov

240.533.0037 (Office)

301.717.7271 (Cell)

[Click here for a StoryMap of 2019 NOAA Hydrographic Surveys](#)

Find us on [Facebook](#), [Twitter](#) and the [NOAA Coast Survey](#) blog

4 attachments


D304.png

588K



HSRR_EC.jpg
96K

 **HSRR_EC.zip**
5K

 **D304-TJ_Survey_Area.zip**
13K

CO.Thomas Jefferson - NOAA Service Account

Fri, Aug 2, 2019 at 10:37 AM

<co.thomas.jefferson@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>

----- Forwarded message -----

From: **Andy Armstrong - NOAA Federal** <andy.armstrong@noaa.gov>

Date: Fri, Aug 2, 2019 at 10:32 AM

Subject: Re: DRIX Testing Schedule and Op Areas

To: Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>

Cc: Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov>, Martha Herzog <martha.herzog@noaa.gov>, CO.Thomas Jefferson - NOAA Service Account <co.thomas.jefferson@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>, Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

All,

I agree with all of Megan's comments and added a few additional.

Suggest we shoot for a planning telephone call on Tuesday.

Thanks,
Andy

On Fri, Aug 2, 2019 at 10:04 AM Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov> wrote:

Starla,
I added a few comments. See attached.
Thanks,
Megan

On Thu, Aug 1, 2019 at 4:54 PM Starla Robinson - NOAA Federal <Starla.Robinson@noaa.gov> wrote:

Andy, Martha, and Megan,

Given the complexity of this PI I would like to run the draft by you all before submitting it as an official draft. If able please review by noon tomorrow. I will append Andy's DriX instructions after the HSD instructions (not included with this document).

Be advised. Doug will be taking this project on starting monday.

Thank you,
Starla

On Thu, Aug 1, 2019 at 4:24 PM CO.Thomas Jefferson - NOAA Service Account <co.thomas.jefferson@noaa.gov> wrote:

All,

Regarding the Yard, we just got another week slip in the schedule (I will send a wider-distro email tomorrow morning). WRT the schedule, I will likely just push everything back a week so what Megan has documented is still fairly accurate. I think the rest of the CY will be on this project, too, so it doesn't matter exactly how many DRIX days are on the schedule, right? We do not likely have enough berthing for two PSes while the DRIX folks are aboard, but I would like to keep the PS support option open to use in helping run the launch that we're planning to leave ashore on the Lower Chesapeake project out of MOC-A.

Thanks,

Bri

On Thu, Aug 1, 2019 at 4:11 PM Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov> wrote:

Starla,
CC'ing Bri in case she has any more recent updates.

Right now the DAS count is 21 days, all of which are funded by NOS/OCS base funding:

- Protected water DRIX testing - 2 days
- Open Water DRIX testing - 11 days
- Further testing - 8 days

I am pulling this information from the CO's detailed schedule from July 2nd.

I agree with Andy that we should meet next week to work on further details with planning.
Megan

On Thu, Aug 1, 2019 at 3:52 PM Andy Armstrong - NOAA Federal
<andy.armstrong@noaa.gov> wrote:

Hi Starla,

I would request that you insert "**research**" in the text as follows: "This project is being conducted in support of UNH's Joint Hydrographic Center research trials....." and insert some text regarding Coast Survey's goals as follows: "It also benefits NOAA's Office of Coast Survey's mission to provide contemporary hydrographic data to maintain and update nautical charting products and services and to advance autonomous hydrographic survey capabilities."

I'm pleased to see PSs on the project, but I'm wondering if there is berthing space. We are requesting 5 berths for IXBlue/UNH participation. Will there be space for 2 PS plus 5 visitors?

I'm not sure of the sea day count; the actual days at sea may depend to some degree on the success of dockside trials.

I would like to get started first of next week with some collaborative project planning with IXBlue, Ops and TJ to develop a more actionable plan than we have now.

Best,
Andy

On Thu, Aug 1, 2019 at 2:02 PM Starla Robinson - NOAA Federal
<Starla.Robinson@noaa.gov> wrote:

Hello Andy,

I am preparing the Project Instructions for OPR-D304-TJ-19 Approaches to Chesapeake Bay, VA/NC part of the DriX Trials.

1) Would it be accurate to say:

"This survey is scheduled to begin in September, 2019 and end in September, 2019. This project is being conducted in support of UNH's Joint Hydrographic Center trials of the DriX ASV, on the behalf of Office of Marine and Aviation Operations (OMAO). It also benefits NOAA's Office of Coast Survey's mission to provide contemporary hydrographic data to maintain and update nautical charting products and services. The survey helps to reduce the backlog in the area."

2) Is it 25 OMAO funded days?

3) Do you have any additional personnel that I should add to the PI's?

Name (Last, First)	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Julia Wallace	PS	9/3	9/19	F	AHB	USA

Name	Title	Date Aboard	Date Disembark	Gender	Affiliation	Nationality
Marshall (FBI)						
Julia	PS	9/3	9/19	F	AHB	USA
Wallace						
Jeff	PS	9/23	9/30	M	AHB	USA
4) Marshall anything else you would like me to add to the PI's other than the word document?						
TBA						
Thank you,						
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 Acquisition: [HSD Planned Hydrographic Surveys](#)
 Website Planning: [OCS Survey Plans](#)

--

Andrew A. Armstrong, Capt. NOAA (Ret.)
 Co-Director
 NOAA/UNH Joint Hydrographic Center
 Chase Ocean Engineering Bldg
 24 Colovos Road
 Durham, NH 03824

office (603) 862-4559
 mobile (240) 676-6090

--

CDR Briana Welton Hillstrom, NOAA
 Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)
 439 W York St, Norfolk, VA 23510
 cell: 520-227-9269
 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 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 Acquisition: [HSD Planned Hydrographic Surveys](#)

| | Website Planning: [OCS Survey Plans](#)

--

Andrew A. Armstrong, Capt. NOAA (Ret.)
Co-Director
NOAA/UNH Joint Hydrographic Center
Chase Ocean Engineering Bldg
[24 Colovos Road](#)
[Durham, NH 03824](#)

[office \(603\) 862-4559](#)
[mobile \(240\) 676-6090](#)

--

CDR Briana Welton Hillstrom, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)
[439 W York St, Norfolk, VA 23510](#)
cell: [520-227-9269](#)
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



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Possible DriX Plan

17 messages

Andy Armstrong - NOAA Federal

Wed, Aug 7, 2019 at 5:44
PM

<andy.armstrong@noaa.gov>

To: _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>

Cc: Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Hi all,

Attached is a strawman for the DriX trials. I have not floated this to IXBlue yet.

Is something like this a reasonable framework? There is certainly room to revise this, by, for example, altering arrival and departure dates around the weekends. As discussed, I would also like to keep the option of shuttle ashore in Lynnhaven Inlet during the HSRR and Protected Waters segment.

If things go well with the trials, we could even finish up a few days early and get out of TJ's way.

Andy

--

Andrew A. Armstrong, Capt. NOAA (Ret.)
Co-Director
NOAA/UNH Joint Hydrographic Center
Chase Ocean Engineering Bldg
[24 Colovos Road](#)
[Durham, NH 03824](#)

office (603) 862-4559
mobile (240) 676-6090

 **DriX Trials CalendarRev1-Alt_8-7-19.docx**
28K

CO.Thomas Jefferson - NOAA Service Account

Thu, Aug 8, 2019 at

<co.thomas.jefferson@noaa.gov>

11:50 AM

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>,

"OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>,

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

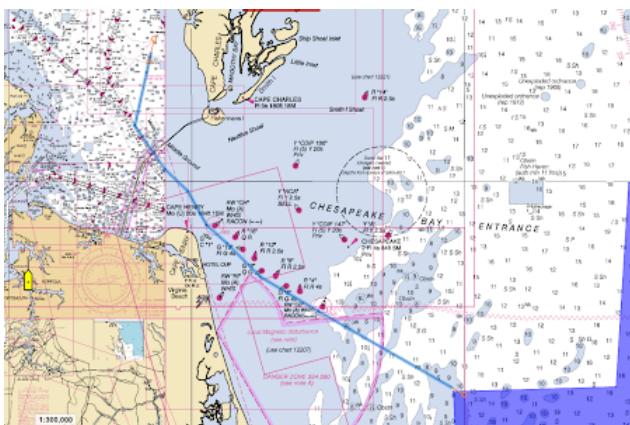
Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA

Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal

<corey.allen@noaa.gov>

Andy,

The ship doesn't have an issue with this schedule and will update the official schedule accordingly. The "open water" days on 9/18-9/19 might be a little inefficient for going offshore (~45 miles - see below) only to come back a day or so later, but we can play it by ear based on how quickly the HSRR goes.



Another thing the CME was discussing this morning was whether we should have the Drix itself or someone from the team on site (or at least available for consult) when we do the annual davit testing with the Vest tech on site b/c we're going to have to adjust the automatic tensioners for the new weight and dimensions of the DRIX. Currently, that's the week of 8/26.

V/r,

Bri

[Quoted text hidden]

--

CDR Briana Welton Hillstrom, NOAA

Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)

439 W York St, Norfolk, VA 23510

cell: 520-227-9269

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

Andy Armstrong - NOAA Federal

Thu, Aug 8, 2019 at 12:04

<andy.armstrong@noaa.gov>

PM

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>
Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

thanks, Bri,

I understand the inefficiency, and also agree that we could actually be ready to go offshore a bit sooner than scheduled, which would ease that concern. What I am aiming for is getting out into open water during the first underway period to try out the launch and recovery in a seaway while the engineering part of the team are still around.

I'm afraid I won't hear back from IXBlue until Aug 12, so haven't had a chance to run this by them. This may be more days than our funding for IXBlue staffing will support; so would it mess up your sea day accomplishments and survey planning if we were to end earlier (possibly as much as a week early)? Personally I prefer the full period, but I just want to put this out as a heads-up.

Best,
Andy

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Thu, Aug 8, 2019 at

<co.thomas.jefferson@noaa.gov>

12:11 PM

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>
Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Thanks, Andy, understood. If we needed to end a week earlier, TJ would just go back out and continue on the offshore project b/c that's what we're scheduled to do for the rest of the CY anyway.

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Mon, Aug 12, 2019 at
10:10 AM

<co.thomas.jefferson@noaa.gov>

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>

Andy,

The Yard missed some pretty big milestones of late (moving fuel back aboard, re-commissioning potable water system, new hvac system currently unable to hold a vacuum, piping still incomplete, plot room furniture still not installed, generator load bank testing rescheduled, etc), which is starting to make me nervous about even this schedule, which seemed well-padded only last week. I'm starting to think it might make sense to schedule DRiX after HSRR and even mid-project within OPR-D304-KR-19. Is that even an option?

V/r,

Bri

[Quoted text hidden]

Andy Armstrong - NOAA Federal

Mon, Aug 12, 2019 at 10:20
AM

<andy.armstrong@noaa.gov>

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>
Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account"

<co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal
<Richard.T.Brennan@noaa.gov>

Ugh, but thanks for the early warning.

I can discuss this with the IXBlue folks. I'm hoping to get in touch with them later today or tomorrow. My concern will be the possibility that our time with the DriX available runs out and it heads off for some commercial work.

What would be the schedule you propose?

Andy

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Mon, Aug 12, 2019 at
12:01 PM

<co.thomas.jefferson@noaa.gov>

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>

I might be being overly alarmist, but I continue to see a lot of work to do and not many workers doing it, as well as scheduled events being postponed. I see us continuing to do this week-to-week delay for some indefinite amount time, and I'm not keen on dragging iXblue through the mud with us. The Yard contact ends Aug 15 and to my knowledge has not been officially extended so they're going into a penalty phase. The network put-back work that we've been trying to have done up here in Brooklyn has been officially held off until Norfolk due to the Yard's inability to give spaces to us when they say they will (none have been turned over to us yet), and is expected to take 2-3 weeks. With respect to the general schedule, I propose being as up front with the DRIX team as we can be and let them decide how they want to proceed. I'm okay leaving the schedule as is and trying to meet it, and/or delaying days or a week at a time. However, if it were just me, I'd choose to push them off until October (a four week delay from what you proposed) and if the ship gets operational before that then we go out and do ORT, HSRR, and start on D304 until DRIX. It's bad enough to be doing this with the crew and the program, and I don't want to do it to iXblue, too.

[Quoted text hidden]

Andy Armstrong - NOAA Federal

Mon, Aug 12, 2019 at 12:19

<andy.armstrong@noaa.gov>

PM

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>
Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>

Hi Bri,

I understand. Let me see what their reaction is to October.

Andy

[Quoted text hidden]

Andy Armstrong - NOAA Federal

Tue, Aug 13, 2019 at 10:57

<andy.armstrong@noaa.gov>

AM

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>
Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Damian Manda <damian.manda@noaa.gov>

Hi Bri, all,

I just spoke with IXBlue. They are amenable to postponing the project start until 8 October (I think this was the date you had in mind) to avoid the uncertainty of schedule issues. A firm date will help them plan and confirm staffing. So, are we confident that October 8 is safe, barring some major unexpected issue? Once we do that, the medical forms process will be simpler.

They also feel that a 3-week project is sufficient, again, unless there are unexpected issues that arise during the trial. That would be 1 week alongside and then 2 weeks underway. If some specialist expertise is needed for a day at sea, they are fine with a boat transfer. Weekends underway pose no problem.

In a meeting with them next week on Monday at 10 am, I plan to develop a more detailed timeline for the work, discuss the pros and cons of crane work on the outboard side of the ship, and to go into more detail on data formats and survey work flow. Would someone from the ship, HSD Ops, and/or HSTB like to join?

Best Regards,
Andy

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Tue, Aug 13, 2019 at
11:53 AM

<co.thomas.jefferson@noaa.gov>

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>,

"OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>,

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

Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA

Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal

<corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account"

<co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal

<Richard.T.Brennan@noaa.gov>, Damian Manda <damian.manda@noaa.gov>

If you want to make it an even three weeks and follow this calendar you created day for day, we could make it Monday, Oct 7- Monday, Oct 28.

V/r,

Bri

[Quoted text hidden]

Andy Armstrong - NOAA Federal

Tue, Aug 13, 2019 at 11:56
AM

<andy.armstrong@noaa.gov>

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>,

"OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>,

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

Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA

Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal

<corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account"

<co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal

<Richard.T.Brennan@noaa.gov>, Damian Manda <damian.manda@noaa.gov>

Ok; let's do that. I'll leave the extra week at the end in the Foreign National Request in case we get blown out for some reason.

Best,
Andy

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Tue, Aug 13, 2019 at
12:26 PM

<co.thomas.jefferson@noaa.gov>

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Cc: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>

Doug,

Unless something comes up with us staffing-wise, I don't think we need any PS support until the end of the project when we should be ready for pre-SARs. Another option would be to use PS Support to run the one launch we leave at MOC-A to continue with the lower Chesapeake Bay project.

Many thanks,

Bri

On Tue, Aug 13, 2019 at 12:08 PM Douglas Wood - NOAA Federal
<douglas.wood@noaa.gov> wrote:

Hi,

do y'all think that there will be need and space for PS support from HSD during the DriX trials?

If not, I will not plan for PS support until November.

Doug

[Quoted text hidden]

--

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

[Quoted text hidden]

Douglas Wood - NOAA Federal

Tue, Aug 13, 2019 at 12:28

<douglas.wood@noaa.gov>

PM

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Cc: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>

Ok.

I will stand by on soliciting anyone from HSD for support until I hear more.

Doug

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Tue, Aug 13, 2019 at

<co.thomas.jefferson@noaa.gov>

12:44 PM

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>

I spoke too soon... I forgot: We'll need someone for the HSRR leg to verify our work.

[Quoted text hidden]

CO.Thomas Jefferson - NOAA Service Account

Wed, Aug 14, 2019 at

<co.thomas.jefferson@noaa.gov>

9:04 AM

To: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>

Cc: "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Damian Manda <damian.manda@noaa.gov>

Andy,

Myself, OPS, and CME would like to join your meeting with DRIX.

Thanks,

Bri

[Quoted text hidden]

Damian Manda <damian.manda@noaa.gov> Fri, Aug 16, 2019 at 3:38 PM
To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>
Cc: Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Hstb Atlantic - NOAA Service Account <hstb.ocs.atlantic@noaa.gov>

Andy,

HSTB would like to have LTJG Matt Sharr join. Is there a call-in number or will part of the TJ team be in Norfolk?

Very Respectfully,

LT Damian Manda, NOAA

Chief, Hydrographic Systems and Technologies Branch
Office of Coast Survey
SSMC3 N/CS11 Rm 6603
(240) 847-8241

[Quoted text hidden]

Andy Armstrong - NOAA Federal Fri, Aug 16, 2019 at 3:54 PM
<andy.armstrong@noaa.gov>
To: Damian Manda <damian.manda@noaa.gov>
Cc: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, "CO.MOC Atlantic - NOAA Service Account" <co.moc.atlantic@noaa.gov>, Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Hstb Atlantic - NOAA Service Account <hstb.ocs.atlantic@noaa.gov>

Hi Damian,

Great. Monday 10 am EDT. All the TJ team is in NY Here is the number:

Dial-in number is +15156065187

Access code is 806862

Host PIN is 2282

Andy

[Quoted text hidden]



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Processing workflow for TJ Drix project

6 messages

Charles Wisotzkey - NOAA Federal

Tue, Aug 6, 2019 at 4:36 PM

<charles.j.wisotzkey@noaa.gov>

To: HSTB Chief <hstb.ocs.chief@noaa.gov>

Cc: _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, Val Schmidt <vschmidt@ccom.unh.edu>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Damian,

Just had a coordination call for the upcoming Drix project on the TJ. The question of processing came up.

Has HSTB had a chance to look at this? Is so, are there any issues with using Drix data to submit to OCS that we should be aware of?

- Charles

--

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

HSTB Chief <hstb.ocs.chief@noaa.gov>

Fri, Aug 9, 2019 at 3:14 PM

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

Cc: _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, Val Schmidt <vschmidt@ccom.unh.edu>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Charles,

Val and I discussed the processing briefly when I was in NH, but HSTB has not looked at any actual data from the system. There are a few concerns, but they have fairly simple remedies:

- The INS is not an Applanix system - iXblue Phins I think
 - Would have to generate their own SBETs and provide them to TJ
- The iXblue team likes to acquire in Qincy, which has a proprietary data format
 - The sonar is a Kongsberg EM2040, simultaneous acquisition in SIS should be possible but will need to be coordinated
 - Verify that offsets in SIS and data recorded to .all files are correct for NOAA workflow
- Processing so far has been done in Qimera, NOAA workflow and other data collected in sheets will be processed in CARIS
 - UNH will create an HVF for the Drix and ensure that all offsets are documented
- With ASV Ben acquisition on FA last year, there was a mentality of acquiring all data (transits, some turns) that led to some issues in post processing.
 - Data delivered for NOAA sheets should be collected only when on survey lines to the extent possible
- DriX will need to be included in DAPR
 - Ship can work with UNH to ensure they have necessary documentation for vessel, sonar and INS for entry into the DAPR

Val/Andy, do you have any issues with providing what is laid out here?

Very Respectfully,

LT Damian Manda, NOAA

Chief, Hydrographic Systems and Technologies Branch
Office of Coast Survey
SSMC3 N/CS11 Rm 6603
(240) 847-8241

[Quoted text hidden]

Andy Armstrong - NOAA Federal

Fri, Aug 9, 2019 at 3:31

<andy.armstrong@noaa.gov>

PM

To: HSTB Chief <hstb.ocs.chief@noaa.gov>

Cc: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, _OMAO MOA

CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Val Schmidt

<vschmidt@ccom.unh.edu>, _OMAO MOA OPS Thomas Jefferson

<ops.thomas.jefferson@noaa.gov>

Damian, Charles, all,

Seems reasonable to me. I will talk to IXBlue about these items next week when some key staff are back from vacation. Val is out in the middle of the Pacific, and August is a tough time to work with France.

In the meantime, I'll have some conversations with folks here on some of these issues. I think that merging the data will be totally doable.

Best Regards,
Andy

[Quoted text hidden]

--

Andrew A. Armstrong, Capt. NOAA (Ret.)
Co-Director
NOAA/UNH Joint Hydrographic Center
Chase Ocean Engineering Bldg
[24 Colovos Road](#)
[Durham, NH 03824](#)

[office \(603\) 862-4559](#)
[mobile \(240\) 676-6090](#)

Val Schmidt <vschmidt@ccom.unh.edu> Fri, Aug 9, 2019 at 5:02 PM
To: HSTB Chief <hstb.ocs.chief@noaa.gov>
Cc: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, _OMAO MOA
CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Andy Armstrong
<andy.armstrong@noaa.gov>, _OMAO MOA OPS Thomas Jefferson
<ops.thomas.jefferson@noaa.gov>

Some comments inline...

On Aug 9, 2019, at 8:14 AM, HSTB Chief <hstb.ocs.chief@noaa.gov>
wrote:

Charles,

Val and I discussed the processing briefly when I was in NH, but HSTB has not looked at any actual data from the system. There are a few concerns, but they have fairly simple remedies:

- The INS is not an Applanix system - iXblue Phins I think
 - Would have to generate their own SBETS and provide them to TJ

During our trial they provided SBETS to us from the Phins. I would expect the same. They would probably also like an RTK feed if it's possible. (NTRIP, RTCM via serial, etc.).

- The iXblue team likes to acquire in Qincy, which has a proprietary data format
 - The sonar is a Kongsberg EM2040, simultaneous acquisition in SIS should be possible but will need to be coordinated
 - Verify that offsets in SIS and data recorded to .all files are correct for NOAA workflow

To my knowledge it is not possible to acquire data in SIS and Qincy simultaneously. I would love to know if this is possible.

Certainly Qincy cannot itself record both dot-all (or kmall) files simultaneously with its own data acquisition system.

One solution here is to treat iXBlue as NOAA does a survey contractor and allow them to provide you grids and possibly XYZ point clouds for the trial. It would be non-standard, but not something impossible to understand and ingest.

- Processing so far has been done in Qimera, NOAA workflow and other data collected in sheets will be processed in CARIS
 - UNH will create an HVF for the Drix and ensure that all offsets are documented

UNH will not likely create an HVF for the Drix. But you can! They will come with a full set of offsets, you just need to understand the reference frames and fill them in.

- With ASV Ben acquisition on FA last year, there was a mentality of acquiring all data (transits, some turns) that led to some issues in post processing.
 - Data delivered for NOAA sheets should be collected only when on survey lines to the extent possible

RRrrrrr! Ok, I'll submit to this line of thinking for this trial, but I totally disagree with the mentality that one should not acquire data on transit lines. When there is sparse data, you collect data everywhere, period. It is a waste of precious time and money not to.

It is this line of "my survey must be regular and pristine" that led the Fairweather to deviate from a charted errant sounding when I was on board for safety reasons. (WHO IS SUPPOSED TO CHECK THE CHART IF NOT NOAA OCS???) [Ok, done ranting.]

- DriX will need to be included in DAPR
 - Ship can work with UNH to ensure they have necessary documentation for vessel, sonar and INS for entry into the DAPR

Make a list of what you need and it can be forwarded to iXBlue.

Val/Andy, do you have any issues with providing what is laid out here?

Very Respectfully,

LT Damian Manda, NOAA

Chief, Hydrographic Systems and Technologies Branch

Office of Coast Survey

SSMC3 N/CS11 Rm 6603

(240) 847-8241

On Tue, Aug 6, 2019 at 4:36 PM Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov> wrote:

Damian,

Just had a coordination call for the upcoming Drix project on the TJ. The question of processing came up.

Has HSTB had a chance to look at this? Is so, are there any issues with using Drix data to submit to OCS that we should be aware of?

- Charles

--

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

Val Schmidt

Center for Coastal and Ocean Mapping / Joint Hydrographic Center

University of New Hampshire

Chase Ocean Engineering Lab

[24 Colovos Road](#)

[Durham, NH 03824](#)

e: [vschmidt \[AT\] ccom.unh.edu](mailto:vschmidt@ccom.unh.edu)

m: 614.286.3726

Hstb Atlantic - NOAA Service Account

<hstb.ocs.atlantic@noaa.gov>

Mon, Aug 19, 2019 at

11:02 AM

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

Cc: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Charles,

It sounded like you've already raised the concerns from this email chain (SBETs, acq systems, etc.) with UNH, but since the hydro person from iXblue wasn't on the line, I wanted to make sure they are addressing the HVF/DAPR information. It seems useful to get at least the vessel survey/offsets ahead of time.

Very respectfully,

-Matt

On Fri, Aug 16, 2019 at 3:37 PM HSTB Chief <hstb.ocs.chief@noaa.gov> wrote:

Data processing concerns for DriX integration into a TJ survey project.

Very Respectfully,

LT Damian Manda, NOAA

Chief, Hydrographic Systems and Technologies Branch

Office of Coast Survey

SSMC3 N/CS11 Rm 6603

(240) 847-8241

[Quoted text hidden]

--

LTJG Matthew B. Sharr, NOAA

Field Support Liaison - Atlantic

NOAA OCS, Hydrographic Systems and Technology Branch

[439 West York St.](#)

[Norfolk, VA 23510](#)

[Office: \(757\) 364-7709](#)

Charles Wisotzkey - NOAA Federal

<charles.j.wisotzkey@noaa.gov>

To: Val Schmidt <vschmidt@ccom.unh.edu>

Wed, Aug 28, 2019 at 2:37

PM

Cc: HSTB Chief <hstb.ocs.chief@noaa.gov>, _OMAO MOA CO Thomas Jefferson <co.thomas.jefferson@noaa.gov>, Andy Armstrong <andy.armstrong@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Val,

Responses below.

On Fri, Aug 9, 2019 at 5:02 PM Val Schmidt <vschmidt@ccom.unh.edu> wrote:
Some comments inline...

On Aug 9, 2019, at 8:14 AM, HSTB Chief <hstb.ocs.chief@noaa.gov> wrote:

Charles,

Val and I discussed the processing briefly when I was in NH, but HSTB has not looked at any actual data from the system. There are a few concerns, but they have fairly simple remedies:

- The INS is not an Applanix system - iXblue Phins I think
 - Would have to generate their own SBETs and provide them to TJ

During our trial they provided SBETS to us from the Phins. I would expect the same. They would probably also like an RTK feed if it's possible. (NTRIP, RTCM via serial, etc.).

I don't know of any public RTK feeds in the areas we'll be working. We use Trimble CenterPoint RTX through Applanix POSPac, so we are tied to the POS MV units. Do you know if the Drix team will have an accurate means of ellipsoid height? Our standard for accuracy is roughly 6-20 cm (2-sigma).

- The iXblue team likes to acquire in Qincy, which has a proprietary data format
 - The sonar is a Kongsberg EM2040, simultaneous acquisition in SIS should be possible but will need to be coordinated
 - Verify that offsets in SIS and data recorded to .all files are correct for NOAA workflow

To my knowledge it is not possible to acquire data in SIS and Qincy simultaneously. I would love to know if this is possible.

The SIS manual seems to confirm this: "When SIS operates as a controller, the following will not be a part of the controller and have to be handled by the third party software: • Installation parameters to calculate the correct depths (not needed by the sounder in real-time) • Calibration • Quality control of the data • Data logging for daily operation • Data cleaning and post-processing • Creation of digital terrain models (DTM), charts, printouts etc."

Certainly Qinsy cannot itself record both dot-all (or kmall) files simultaneously with its own data acquisition system.

One solution here is to treat iXBlue as NOAA does a survey contractor and allow them to provide you grids and possibly XYZ point clouds for the trial. It would be non-standard, but not something impossible to understand and ingest.

As long as things in Qinsy are setup correctly, do you see any reason why we can't ingest the kmall file from Qinsy into CARIS? That would allow us to do our normal QC / uncertainty processes.

Alternatively, can we ask the Drix team if they can set things up on the Drix so that the pilot can use Qinsy (for acquisition control) and SIS (for acquisition) separately? This is what we do with HYPACK (used for line driving/interfaces) and SIS (to log to .all).

- Processing so far has been done in Qimera, NOAA workflow and other data collected in sheets will be processed in CARIS
 - UNH will create an HVF for the Drix and ensure that all offsets are documented

UNH will not likely create an HVF for the Drix. But you can! They will come with a full set of offsets, you just need to understand the reference frames and fill them in.

Can you ask the Drix team to provide the documentation now? We can have HSTB work up the HVFs.

- With ASV Ben acquisition on FA last year, there was a mentality of acquiring all data (transits, some turns) that led to some issues in post processing.
 - Data delivered for NOAA sheets should be collected only when on survey lines to the extent possible

RRrrrr! Ok, I'll submit to this line of thinking for this trial, but I totally disagree with the mentality that one should not acquire data on transit lines. When there is

sparse data, you collect data everywhere, period. It is a waste of precious time and money not to.

It is this line of “my survey must be regular and pristine” that led the Fairweather to deviate from a charted errant sounding when I was on board for safety reasons. (WHO IS SUPPOSED TO CHECK THE CHART IF NOT NOAA OCS???) [Ok, done ranting.]

I agree, we need to change this mindset. As long as we are going slow enough and working in shallower water, this should be acceptable. However, I do whatever you and HSTB agree to.

- DriX will need to be included in DAPR
 - Ship can work with UNH to ensure they have necessary documentation for vessel, sonar and INS for entry into the DAPR

Make a list of what you need and it can be forwarded to iXBlue.

I've attached an example of the report we have to write. We basically need equipment specs (vessel and major survey components/instrumentation), offsets/how everything is integrated, a description of how data is acquired, and a description of how data is processed/QC'ed

[Quoted text hidden]

[Quoted text hidden]



OPR-D304-TJ-18_DAPR.pdf

392K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Followup to OPR-D304-TJ-19 pre-brief

2 messages

Douglas Wood - NOAA Federal

Wed, Sep 18, 2019 at 11:27 AM

<douglas.wood@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>, CO Thomas Jefferson

<co.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account"

<xo.thomas.jefferson@noaa.gov>, "ChiefST.Thomas Jefferson - NOAA Service Account"

<chiefst.thomas.jefferson@noaa.gov>, Edward Owens - NOAA Federal

<edward.owens@noaa.gov>, James Europe - NOAA Federal

<james.r.europe@noaa.gov>, Ryan Wartick - NOAA Federal <ryan.wartick@noaa.gov>,

Christina Fandel - NOAA Federal <christina.fandel@noaa.gov>, Alexandra Dawson -

NOAA Affiliate <alexandra.dawson@noaa.gov>, Daniel Garatea - NOAA Federal

<daniel.garatea@noaa.gov>, Castle Parker - NOAA Federal

<castle.e.parker@noaa.gov>, Andy Armstrong - NOAA Federal

<andy.armstrong@noaa.gov>, Eric Younkin - NOAA Federal

<eric.g.younkin@noaa.gov>, Calandria DeCastro - NOAA Federal

<calandria.m.decastro@noaa.gov>

Hi,

Thank you for attending the Tuesday, September 17th pre-briefing on the pending survey OPR-D304-TJ-19, Approaches to Chesapeake Bay. In attendance at AHB were the ship's Ops, XO, CO, CST, MOC-A Deputy Ops, Chief AHB, Andy Armstrong, Gene Parker, LT DeCastro, LT Europe; in HSD Ops Douglas Wood (PM), Christy Fandel, Alex Dawson and Dan Garatea. Apologies to anyone else attending at AHB that I might have missed writing down...

The primary goal of the meeting is to go over the project instructions, environmental compliance issues, CSF/PRF, scheduling, and background on the DriX ASV and look for missed details.

The survey itself is generally straight-forward being offshore in a relatively obstruction free area with a minimum depth of ~9 fathoms. *Complete Coverage* is desired and per discussion the ship plans to conduct MBES operation (HSSD 5.2.2.3 Option A) where the DriX is involved. This and *Complete Coverage option B* are an option.

As the ship intends to operate an aerial drone as part of the DriX operations the Ops Officer is seeing to it that the ship has a trained operator and will be in compliance with the NOAA regulations.

Per Andy Armstrong: the DriX is expected to acquire using Quincy and FIN?, navigation will be acquired with an IXBlue IMU. Eric Yonkin is currently at UNH and is working on integrating these systems with our own procedures which is doubtless no small chore. The DriX will be using sound speed profiles from the ship, it is unclear to me whether these will be uploaded to the DriX during acquisition or just post-processed into the data. There was discussion suggesting that the survey will be conducted using a line plan as mixing matrix files live from the DriX and ship might not be feasible. As much as I would love to get involved in this discussion I will leave it to the ship and DriX ops folk.

Watch out for turtles; this is also a concern for the DriX. Per the BMP, stay below 10kts in the cautionary area for Right Whales near Ches-Bay.

The survey area overlaps with a Naval Fleet Forces Atlantic Exercise area. Gene dredged up some background indicating that the area is not used for live fire any longer but there are probably other activities that the navy conducts. I forwarded some historic information to the navigation manager (Ed) and he will be communicating our plans to the FFAECC project manager.

Depending on conditions of waves and swell, the ship may change acquisition order of the sheets with approval from the PM. As the DriX surveys will be MBES it might be prudent to run it on the offshore, deeper sheets. Afterward, SSS can be used by the ship and launches on the more shallow sheets to gain efficiency. Also, if conditions dictate east-west lines for the two western sheets their orientation may be changed. Let the PM (me) know about any changes and I will update the PRF as necessary.

This is what I have so far; I expect to forward final, signed PI soon. Let me know if y'all need anything else.

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

Andy Armstrong - NOAA Federal

Wed, Sep 18, 2019 at 1:54

<andy.armstrong@noaa.gov>

PM

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Cc: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>, CO Thomas Jefferson

<co.thomas.jefferson@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account"

<xo.thomas.jefferson@noaa.gov>, "ChiefST.Thomas Jefferson - NOAA Service Account"

<chiefst.thomas.jefferson@noaa.gov>, Edward Owens - NOAA Federal

<edward.owens@noaa.gov>, James Europe - NOAA Federal

<james.r.europe@noaa.gov>, Ryan Wartick - NOAA Federal <ryan.wartick@noaa.gov>,

Christina Fandel - NOAA Federal <christina.fandel@noaa.gov>, Alexandra Dawson -

NOAA Affiliate <alexandra.dawson@noaa.gov>, Daniel Garatea - NOAA Federal

<daniel.garatea@noaa.gov>, Castle Parker - NOAA Federal

<castle.e.parker@noaa.gov>, Eric Younkin - NOAA Federal <eric.g.younkin@noaa.gov>,

Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Thanks for the summary, Doug,

I don't have anything to add or any questions at this point. DriX is in the water at the UNH pier, but some setting up remains to be completed before we start trials here.

Andy

[Quoted text hidden]

--

Andrew A. Armstrong, Capt. NOAA (Ret.)

Co-Director

NOAA/UNH Joint Hydrographic Center

Chase Ocean Engineering Bldg

[24 Colovos Road](#)

[Durham, NH 03824](#)

[office \(603\) 862-4559](#)

[mobile \(240\) 676-6090](#)



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

DriX Project Op Area Instructions 2019 (Updated 10142019_1000)

1 message

CO.Thomas Jefferson - NOAA Service Account

Mon, Oct 14, 2019 at
10:18 AM

<co.thomas.jefferson@noaa.gov>

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>, Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>, Julia Waldsmith <julia.m.waldsmith@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Patrick Faha <patrick.faha@noaa.gov>, Taylor Krabel <taylor.krabel@noaa.gov>, Tyler Aldrich <tyler.aldrich@noaa.gov>, "XO.Thomas Jefferson - NOAA Service Account" <xo.thomas.jefferson@noaa.gov>, Sydney Catoire - NOAA Federal <sydney.catoire@noaa.gov>

Cc: "ChiefB.Thomas Jefferson - NOAA Service Account"

<chiefb.thomas.jefferson@noaa.gov>, "ChiefET.Thomas Jefferson - NOAA Service Account" <chiefet.thomas.jefferson@noaa.gov>, "ChiefEng.Thomas Jefferson - NOAA Service Account" <chiefeng.thomas.jefferson@noaa.gov>, Val Schmidt <vschmidt@ccom.unh.edu>

Bridge Watch-standers,

Please see attached Op Area Instructions for the DriX project. Don't be surprised if these change mid-leg as we learn more about this vehicle. This version will be posted on the bridge shortly.

Please let me know if you have any questions or see any typos/errors, etc.

R,

CO

--

CDR Briana Welton Hillstrom, NOAA

Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)

[439 W York St, Norfolk, VA 23510](#)

cell: [520-227-9269](tel:520-227-9269)

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



DriXProjectOpArea Instructions 2019_10142019_1000.pdf

133K



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

October 14, 2019 (initial)

MEMORANDUM FOR: TJ Underway and At Anchor Watchstanders

FROM: CDR Briana W. Hillstrom, NOAA
Commanding Officer, NOAA Ship *Thomas Jefferson*

SUBJECT: Operating Instructions for DriX Project, Chesapeake Bay, October, 2019

While we are working on this project, the following operating orders supersede the standing orders where they conflict but may be superseded by my night orders. They do not apply to transits outside of the working grounds.

1) Navigation

- a. Keep the ship outside the 25 ft contour, and at least 0.3 NM from any feature, sounding, or contour of 18 ft or less, unless cleared by me in advance. This will be generally approximated by exclusion areas marked on ECDIS and/or Rosepoint, but should be verified by each oncoming watch turning turnover.
- b. On transits within the working grounds, operate in strict accordance with the NavRules and do not claim Restricted in Ability to Maneuver (RAM).
- c. Claim Restricted in Ability to Maneuver (RAM) only when the side scan is deployed.
- d. When in the VACAPES Op area (see diagram posted on chart table), note all security calls from War Ships with their current/updated position, required CPA, and plot both the position and CPA with an object circle in Coastal.

2) Weather

- a. Sound reduced visibility signals with 1 mile visibility or less while underway. If your watch doesn't have three people on it already, request from the XO an additional watch stander to be posted on the bridge wing or bow if visibility falls to below 0.5 NM.
- b. Notify the DriX Pilot if rain or reduced visibility (>3 NM) is expected within the next hour based on monitoring of weather predictions and radar online, shipboard radar, and bridge lookout.

3) Traffic



- a. Maintain radar plots on all commercial traffic within 6 NM, and on all vessels within 2 NM.
- b. Attempt radio contact with every vessel with a CPA of less than 1 NM of the ship or DriX when the DriX is deployed. Attempt radio contact with every vessel with a CPA of less than 0.5 NM of the ship when the DriX is not deployed.
- c. Make security calls at least every hour when DriX is in the water. Make security calls at least every four hours when the ship alone is conducting survey operations. Do not state that we are operating an autonomous vehicle when making security calls (see sample script below).
- d. Ask for a 0.5 NM CPA in the G Anchorage and Lynnhaven Roads Op areas, and for a 1 NM CPA at the Cape Charles and OPR-D304-TJ-19 Op areas when making passing arrangements or security calls on behalf of the ship and DriX.
- e. For close encounters with small craft (collision likely without change):
 - i. Call me to the bridge
 - ii. Sound 5 short at 200 yards with the ship or at 400 yards if the DriX is in the water and notify the DriX pilot in plot.
 - iii. Take evasive action if necessary to avoid an imminent collision
- f. Whenever we get close enough to another vessel so that you can see the faces of the people aboard, walk out to the bridge wing, smile and wave. Resist the temptation to return rude gestures.

4) Call the CO

- a. If any commercial traffic will pass with less than 1 NM CPA (without arrangements) while underway, or if you have made arrangements for less than 0.5 NM meeting starboard to starboard or 0.25 NM CPA any other way.
- b. If you anticipate close quarters with a small vessel. Do this only if you have time.
- c. If a distress call plots within 20 NM of the ship or the launches.
- d. If the survey plan must be changed for any reason (also call the FOO).
- e. When a survey line will pass within 0.15 NM of a navigational aid or the 30-ft contour; or within 0.3 NM of any charted 18-ft or shallower feature / contour / sounding.
- f. If winds are sustained above 15 kts or seas are greater than four feet.
- g. If the DriX stops working in its intended mode or for any other emergency operation with the DriX.

5) Discharge and water making

- a. Unless otherwise directed, do not discharge gray water or sewage unless > 12 NM from land.
- b. Discharge of food waste is permitted outside 12 NM of land

- c. Make water as necessary when underway and, except while discharging, while in the OPR-D304-TJ-19 Approaches to Chesapeake Bay op area.

6) Communications

- a. We are here to serve: the people on the other end of the radio are taxpayers and our customers. Go out of your way to be polite and deferential, while following the Nav Rules and ensuring the ship's safety.
- b. Monitor VHF channels F1, 14 (Pilots where applicable), 13A, and 16 on the bridge.

7) Launches and DriX

- a. Monitor the position of the launches and DriX by AIS in ECDIS, Rosepoint/Coastal, and Hypack.
- b. Ensure hourly check-ins are completed by the launch.
- c. Maintain positive contact with the DriX watch stander in the plot room either via F1 or the survey intercom.
- d. Perform radio checks on F1, 82A and on at least one launch phone (cell or Iridium) before or shortly after the time of deployment.
- e. When the launches and DriX are deployed, look out the windows, monitor the ship's radars, and observe the radar and lightning strike layers in Wundermap (wunderground.com website) for inclement weather. Notify CO and launches if it may impact the launch operation areas.
- f. When the DriX is deployed, notify the DriX watchstander on F1 before making any significant speed changes or turns, especially if unplanned.
- g. Be prepared to conn the DriX if a situation arises in which you deem it necessary to avoid a collision (e.g. "slow the DriX down to X knots", "hove to; stop the DriX", "turn the DriX to starboard 90 degrees", etc).

Example Security Call: "Securita securitae securitae, NOAA Ship Thomas Jefferson is conducting hydrographic survey operations in _____(e.g. the vicinity of Lamberts Bend, the Kilo Anchorages, 3 NM SW of Cape Charles, 30 NM off of Virginia Beach, etc) with two small survey boats in the water, requesting an X NM CPA."

Securitae securitae securitae, three 30-ft NOAA hydrographic survey vessels are underway from the NOAA pier in downtown Norfolk across from Hospital Point, bound for survey operations in the vicinity of the kilo anchorages. One has a red hull with a submarine-like conning tower and the other two are grey-hulled launches. NOAA Ship Thomas Jefferson standing by 13/16. Out.

Securitae securitae securitae, NOAA Ship Thomas Jefferson is conducting hydrographic survey operations in the vicinity of the Kilo Anchorage with three 30-ft hydrographic survey vessels. One has a red hull with a submarine-like conning tower and the other two are grey-hulled launches. NOAA Ship Thomas Jefferson standing by 13/16. Out.

Securitae securitae securitae, three 30-ft NOAA hydrographic survey vessels are inbound from the vicinity of the Kilo Anchorages bound for the NOAA pier in downtown Norfolk across from Hospital Point. One has a red hull with a submarine-like conning tower and the other two are grey-hulled launches. NOAA Ship Thomas Jefferson standing by 13/16. Out.



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

RE: [Non-DoD Source] Re: NOAA UAS OPS 18-31 oct nov 9-22 2019 REQUEST FORM

3 messages

Thomas, Gregory W CTR USN USFFC (US)

Fri, Sep 27, 2019 at
1:47 PM

<gregory.w.thomas.ctr@navy.mil>

To: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>

Cc: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>, Edward Owens - NOAA Federal

<edward.owens@noaa.gov>, "Clark, John F Jr CTR (US)" <john.clark3.ctr@navy.mil>,

"Hill, Victor D CTR USN USFFC (USA)" <victor.d.hill1.ctr@navy.mil>, "Nelson, Benjamin CTR USN COMNAVAIRLANT NOR VA (US)" <benjamin.nelson1.ctr@navy.mil>

Charles,

Please get back with us about the UAS ops. We will treat these as a separate UAS event and not as a VDS.

The attached word document is the required document for all UAS request.

The POC for all UAS approvals go through our FFAECC UAS POC Mrs. Maria Simmons. She is in the TO line of this email and her phone number is (757) 425-1852.

Please get this form filled out and back to us since these take time for approval. Frequency approval is this big one on these so please give her a call about any UAS questions.

Very Respectfully

Gregory Thomas

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC)

Operations and Asset Manager

(757) 425-2672 DSN: 433-1299

gregory.w.thomas.ctr@navy.mil

Collective Email:

NIPR: FFAECC@navy.mil

SIPR: FFAECC@navy.smil.mil

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

Sent: Friday, September 27, 2019 12:39 PM

To: Thomas, Gregory W CTR USN USFFC (US) <gregory.w.thomas.ctr@navy.mil>

Cc: OPS.Thomas Jefferson - NOAA Service Account

<ops.thomas.jefferson@noaa.gov>; Edward Owens - NOAA Federal

<edward.owens@noaa.gov>; Clark, John F Jr CTR (US)

<john.clark3.ctr@navy.mil>; Hill, Victor D CTR USN USFFC (USA)

<victor.d.hill1.ctr@navy.mil>; Nelson, Benjamin CTR USN COMNAVAIRLANT NOR

VA (US) <benjamin.nelson1.ctr@navy.mil>

Subject: [Non-DoD Source] Re: NOAA OPS LAT/LONGS 18-31 oct nov 9-22 2019

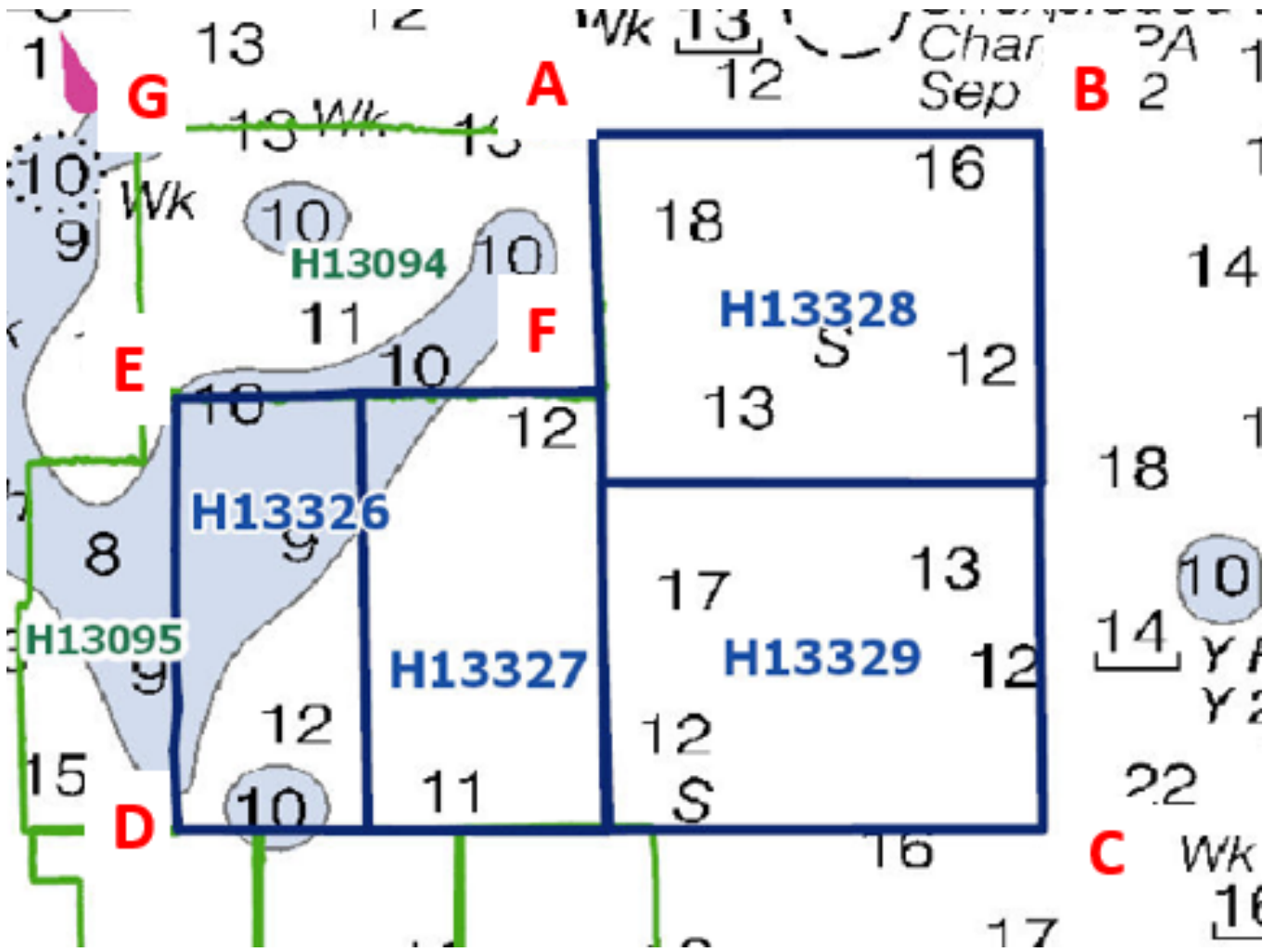
Sir,

Here they are in WGS 84 Degrees-Minutes:

A 36-48.985970 N 075-14.728140 W

B	36-48.992834	075-02.574818
C	36-29.982730	075-02.418259
D	36-29.978992	075-26.120100
E	36-41.779859	075-26.146604
F	36-41.790110	075-14.507361
G	36-49.154537	075-26.481130

*** NOTE: G is just for convenience in plotting. We will be working in the blue polygons defined by vertices A-F.



V/R,

On Fri, Sep 27, 2019 at 3:27 PM Thomas, Gregory W CTR USN USFFC (US) <gregory.w.thomas.ctr@navy.mil> wrote:

OPS,

Do you have the 4 corners yet for the op area you will be in. We have some SOCOM conflict events that have popped up since our conversation yesterday.

Very Respectfully

Gregory Thomas

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC)

Operations and Asset Manager

(757) 425-2672 DSN: 433-1299

gregory.w.thomas.ctr@navy.mil

Collective Email:

NIPR: FFAECC@navy.mil

SIPR: FFAECC@navy.smil.mil

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

Sent: Thursday, September 26, 2019 12:50 PM

To: Thomas, Gregory W CTR USN USFFC (US)

<gregory.w.thomas.ctr@navy.mil>

Cc: OPS.Thomas Jefferson - NOAA Service Account

<ops.thomas.jefferson@noaa.gov>; CO.Thomas Jefferson - NOAA Service Account <co.thomas.jefferson@noaa.gov>; FFAECC <FFAECC@navy.mil>;

Edward Owens - NOAA Federal <edward.owens@noaa.gov>; DeputyOps MOA - NOAA Service Account <DeputyOps.MOA@noaa.gov>

Subject: [Non-DoD Source] Re: Invitation: Meeting - KBR Fleet Forces Atlantic Exercise Coordination... @ Thu Sep 26, 2019 2pm - 3pm (EDT)

(ops.thomas.jefferson@noaa.gov)

Roger that.

Below is some information to assist with the conversation and for future reference.

Contacts:

Ship numbers:

In port phone: 757-441-6322

VOIP (underway): 541-867-8927/8928

Iridium (underway): 808-434-2706

Commanding Officer:

CDR Briana Hillstrom, NOAA

co.thomas.jefferson@noaa.gov

Operations Officer:

LCDR Charles Wisotzkey, NOAA or LT Cali Decastro, NOAA (we are overlapping/conducting passdown, so you might hear from either one of us)

ops.thomas.jefferson@noaa.gov

Shore side contacts at Marine Operations Center Atlantic:

Operations: (757)441-6842 or (757) 441-6238

Vessels:

[NOAA Ship THOMAS JEFFERSON](#) carrying/utilizing one 29 ft Hydrographic Survey Launch (see below) and one [iXblue Drix unmanned remotely operated/autonomous surface vehicle](#):

Operations:

- Hydrographic survey operations and systems testing.

- Proof of concept for use of the unmanned Drix system from the THOMAS JEFFERSON.

- Both the unmanned Drix and the manned HSL will operate well within line of sight of the ship; the unmanned system will not be used more than 1-2 nm from the ship.

- Periodic water column sensor deployment to approximately 5-10% off the sea bottom from the ship.

- Aerial drone operations from the ship using a [Phantom 4 drone](#); drone is authorized for a maximum deployment of 400 ft and will not operate farther than 1 nm from the ship.

- Ship will operate multibeam and side scan sonar systems. HSL and Drix will operate multibeam sonar systems only. The maximum frequency range of the systems we will use will be from approximately 80 to 600 khz.

- The ship will continuously tow a sound speed tensor close to the ship (except for deployments) and may utilize a towed side scan system. Maximum length of towed gear will be approximately 100m.

- The ship may tow the unmanned system in case of equipment failure or if we need to recover the systems in protected waters.

- Typical operations involve the systems running long survey lines in alternating reciprocal directions.

- Security calls will be made at least once per watch (~ every 4 hours) on Channels 13 and 16.

Schedule of operations within or around the security zone:

18-31 OCT (operations w/ the Drix)

09-22 NOV (normal ship operations)

Where:

Picture of an HSL:

--

LCDR Charles J. Wisotzkey, NOAA

NOAA Ship Thomas Jefferson (S-222)

On Thu, Sep 26, 2019 at 12:11 PM Thomas, Gregory W CTR USN USFFC (US) <gregory.w.thomas.ctr@navy.mil> wrote:

No problem we will see you then. I will be at the quarterdeck to escort you up to the 2nd deck.

Very Respectfully

Gregory Thomas

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC)

Operations and Asset Manager

(757) 425-2672 DSN: 433-1299

gregory.w.thomas.ctr@navy.mil

Collective Email:

NIPR: FFAECC@navy.mil

SIPR: FFAECC@navy.smil.mil

From: Charles Wisotzkey <charles.j.wisotzkey@noaa.gov>

Sent: Thursday, September 26, 2019 12:09 PM

To: Thomas, Gregory W CTR USN USFFC (US)
<gregory.w.thomas.ctr@navy.mil>

Cc: OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>; CO.Thomas Jefferson - NOAA Service Account
<co.thomas.jefferson@noaa.gov>; FFAECC
<FFAECC@navy.mil>; Edward Owens - NOAA Federal
<edward.owens@noaa.gov>

Subject: [Non-DoD Source] Re: Invitation: Meeting - KBR Fleet Forces Atlantic Exercise Coordination... @ Thu Sep 26, 2019 2pm - 3pm (EDT)
(ops.thomas.jefferson@noaa.gov)

Mr. Thomas,

I am the Operations Officer on the TJ (soon to rotate off, LT Decastro will be replacing me). I'll be attending this meeting in place of the TJ CO and LT Decastro. Please advise if you have any special instructions; otherwise, I will see you at 1400. Apologies for the late change.

My contact info:

LCDR Charles Wisotzkey, NOAA

Operatios Officer

NOAA Ship THOMAS JEFFERSON

Cell: 2108965025

On Sep 25, 2019, at 1:31 PM, Edward Owens - NOAA Federal
<edward.owens@noaa.gov> wrote:

You have been invited to the following event.

[more details »](#)

Meeting - KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC)

Ed,

The time for our meeting is set up for 2:00PM tomorrow. We will discuss the Operational areas you want to be in along with possible conflicting events with fleet training in those areas. My number is below.

Jay Clark is 757 425-2671

Vic Hill is 757-433-1328

Any questions feel free to call.

Very Respectfully

Gregory Thomas

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC)

Operations and Asset Manager

(757) 425-2672 DSN: 433-1299

gregory.w.thomas.ctr@navy.mil

Collective Email:

NIPR: FFAECC@navy.mil

SIPR: FFAECC@navy.smil.mil

When Thu Sep 26, 2019 2pm – 3pm Eastern Time - New York

Where 601 Oceana Blvd, Virginia Beach, VA 23454, USA
([map](#))

Calendar ops.thomas.jefferson@noaa.gov

Who ✪ edward.owens@noaa.gov - organizer

✪ co.thomas.jefferson@noaa.gov

✪ ops.thomas.jefferson@noaa.gov

Attachments [601 Oceana Blvd.jpg](#)

Going (ops.thomas.jefferson@noaa.gov)? **Yes - Maybe - No** [more options](#) »

Invitation from [Google Calendar](#)

You are receiving this email at the account ops.thomas.jefferson@noaa.gov because you are subscribed for invitations on calendar ops.thomas.jefferson@noaa.gov.

To stop receiving these emails, please log in to <https://www.google.com/calendar/> and change your notification settings for this calendar.

Forwarding this invitation could allow any recipient to send a response to the organizer and be added to the guest list, or invite others regardless of their own invitation status, or to modify your RSVP. [Learn More](#).

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

--

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



FACSFAC UAS Request Form (2018).docx

28K

Charles Wisotzkey - NOAA Federal

Thu, Oct 3, 2019 at 5:15

<charles.j.wisotzkey@noaa.gov>

AM

To: Casey Marwine <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>

Cc: "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Edward Owens - NOAA Federal <edward.owens@noaa.gov>, "Clark, John F Jr CTR (US)" <john.clark3.ctr@navy.mil>, "Hill, Victor D CTR USN USFFC (USA)" <victor.d.hill1.ctr@navy.mil>, "Nelson, Benjamin CTR USN COMNAVAIRLANT NOR VA (US)" <benjamin.nelson1.ctr@navy.mil>, "Thomas, Gregory W CTR USN USFFC (US)" <gregory.w.thomas.ctr@navy.mil>

Casey, Nicole,

I understand the you and LT Decastro spoke about this. Attached you will find the form/information that FFAECC needs. Mr. Greg Thomas can serve as your primary POC there.

Mr. Thomas,

LT Casey Marwine and LTJG Chappelle will be able to provide you with the information you need.

Apologies for the slow followup. Just let us know if the approval timeline is an issue and we can adjust if needed.

V/R,
LCDR Charles Wisotzkey

[Quoted text hidden]



FACSFAC UAS Request Form (2018).docx

28K

Thomas, Gregory W CTR USN USFFC (US)

Thu, Oct 3, 2019 at

<gregory.w.thomas.ctr@navy.mil>

7:05 AM

To: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, Casey Marwine <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>

Cc: "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Edward Owens - NOAA Federal <edward.owens@noaa.gov>, "Clark, John F Jr CTR (US)" <john.clark3.ctr@navy.mil>, "Hill, Victor D CTR USN USFFC (USA)" <victor.d.hill1.ctr@navy.mil>, "Nelson, Benjamin CTR USN COMNAVAIRLANT NOR VA (US)" <benjamin.nelson1.ctr@navy.mil>

ALCON,

Maria Simmons (757) 425-1852 is the POC for all UAS ops not I. I have scheduled the Op areas for Thomas Jefferson VDS/underwater survey ops.

[Quoted text hidden]



Calandria DeCastro - NOAA Federal
<calandria.m.decastro@noaa.gov>

Faha FAA 107 Temporary Certificate

11 messages

Patrick Faha - NOAA Federal <patrick.faha@noaa.gov> Thu, Oct 17, 2019 at 12:51 PM
To: Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Good Afternoon Casey,

Thank you for your patience and assistance throughout this process. Please find attached copies of my platform specific training as well as my temporary 107 license certificate. Please let me know if there is anything else you will require.

V/R,

ENS Patrick Faha

Junior Officer, NOAA Ship *Thomas Jefferson*

Ship Land Line: 757-441-6322

Ship Cell: 757-647-0187

Ship Iridium: 808-434-2706

patrick.faha@noaa.gov

2 attachments

 **Faha - 107 Airman Certificate.pdf**
285K

 **Faha - UAS Training Certificate.pdf**
6835K

Casey Marwine - NOAA Federal

<casey.s.marwine@noaa.gov>

Fri, Oct 18, 2019 at 10:38

AM

To: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, _omao_aoc_uas
<aoc.uas@noaa.gov>

Cc: Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

ENS Faha,

Can you confirm which platforms you flew during the dart drones training?

V/R,

Casey

[Quoted text hidden]

--

Casey S. Marwine LT/NOAA
Twin Otter Pilot / UAS
Aircraft Operations Center
C:301-471-1683



Patrick Faha - NOAA Federal <patrick.faha@noaa.gov> Fri, Oct 18, 2019 at 12:47 PM
To: Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>
Cc: _omao_aoc_uas <aoc.uas@noaa.gov>, Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Good Afternoon Casey,

The platforms I flew for the course were the DJI Mavic 2 and Phantom 4.

V/R,

ENS Patrick Faha

Junior Officer, NOAA Ship *Thomas Jefferson*

Ship Land Line: [757-441-6322](tel:757-441-6322)

Ship Cell: [757-647-0187](tel:757-647-0187)

Ship Iridium: [808-434-2706](tel:808-434-2706)

patrick.faha@noaa.gov

[Quoted text hidden]

Jonathan Neuhaus - NOAA Federal

Fri, Oct 18, 2019 at 1:46

<jonathan.neuhaus@noaa.gov>

PM

To: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>

Cc: Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, _omao_aoc_uas

<aoc.uas@noaa.gov>, Calandria DeCastro - NOAA Federal

<calandria.m.decastro@noaa.gov>

Patrick,

We are writing a PIC letter for you that will be for both of these aircraft. We also will have an airworthiness for the Mavic Zoom.

[Quoted text hidden]

--

CDR Jon Neuhaus, NOAA
Chief, UAS Section
NOAA Aircraft Operations Center
Lakeland, FL
o: 863-500-3895
c: 661-316-9429

Calandria DeCastro <calandria.m.decastro@noaa.gov> Fri, Oct 18, 2019 at 2:36 PM
To: Jonathan Neuhaus - NOAA Federal <jonathan.neuhaus@noaa.gov>
Cc: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

All,

We have a great weather window tomorrow in the York River area. We are hoping to get some UAS flights in. Is this something we'll be able to do? We will plan to use HSTB's Phantom 4 unless told otherwise.

V/r,

[Quoted text hidden]

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*

[Quoted text hidden]

Calandria DeCastro <calandria.m.decastro@noaa.gov> Fri, Oct 18, 2019 at 3:16 PM
To: Jonathan Neuhaus - NOAA Federal <jonathan.neuhaus@noaa.gov>
Cc: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

Good afternoon CDR Neuhaus,

Apologize for the last minute request, but would it be possible to get the attached Federal Policy Checklist signed this afternoon? Thank you in advance for your assistance.

V/r,

On Fri, Oct 18, 2019 at 1:47 PM Jonathan Neuhaus - NOAA Federal
<jonathan.neuhaus@noaa.gov> wrote:

[Quoted text hidden]

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*

[Quoted text hidden]

 **Federal Policy Checklist.pdf**
145K

Jonathan Neuhaus - NOAA Federal

Fri, Oct 18, 2019 at 3:23

<jonathan.neuhaus@noaa.gov>

PM

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Cc: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, Casey Marwine - NOAA
Federal <casey.s.marwine@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

Yes, I expect to sign this off today. We are still missing some other pieces to the puzzle though, such as the PIC designation letter for Faha. This is signed by our CO at AOC.

[Quoted text hidden]

Jonathan Neuhaus - NOAA Federal

Fri, Oct 18, 2019 at 3:34

<jonathan.neuhaus@noaa.gov>

PM

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Cc: Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, Casey Marwine - NOAA
Federal <casey.s.marwine@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

Attached...

I'll see if I can run down any missing items, but I can't promise anything...

On Fri, Oct 18, 2019 at 3:16 PM Calandria DeCastro

<calandria.m.decastro@noaa.gov> wrote:

[Quoted text hidden]

[Quoted text hidden]

 **Federal Policy Checklist_TJ_UAS Mission__Signed.pdf**
318K

Casey Marwine - NOAA Federal

Fri, Oct 18, 2019 at 5:21

<casey.s.marwine@noaa.gov>

PM

To: Jonathan Neuhaus - NOAA Federal <jonathan.neuhaus@noaa.gov>

Cc: Calandria DeCastro <calandria.m.decastro@noaa.gov>, Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

All,

Attached are the signed NIFs for operations.

Please let me know if you have any questions.

V/R,

Casey

[Quoted text hidden]

2 attachments



NOTICE OF INTENT TO FLY Form(V4)_DriX signed.doc

959K



NOTICE OF INTENT TO FLY Form(V4)_MOC A signed.doc

1051K

Calandria DeCastro <calandria.m.decastro@noaa.gov> Sun, Oct 20, 2019 at 2:11 PM

To: Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>

Cc: Jonathan Neuhaus - NOAA Federal <jonathan.neuhaus@noaa.gov>, Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

All,

Thanks again for the quick turnaround on the last of the paperwork needed to make this happen. We're really happy with the footage we were able to get of the DriX underway alongside the launch and ship. We look forward to flying again!

V/r,

[Quoted text hidden]

Casey Marwine - NOAA Federal

Sun, Oct 20, 2019 at 5:12

<casey.s.marwine@noaa.gov>

PM

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Cc: Jonathan Neuhaus - NOAA Federal <jonathan.neuhaus@noaa.gov>, Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>, _omao_aoc_uas <aoc.uas@noaa.gov>

I'm glad to hear you had a successful day of flying and filming. We really appreciate the photos and video. They help in our monthly reports.

Please let us know if you need anything else.

Casey

[Quoted text hidden]

AOC UAS Notification of Intent to Fly

Date of Submission:
September 30, 2019

Purpose: This authorization supports AOC Flight Authorizations over a very large area of airspace requiring time critical flexibility of operations. It is intended to assist in the coordination of airspace where specific area long term planning is not feasible. No flights shall be conducted without review and approval from an AOC UAS Staff officer. This request should be made as soon as flight planning information is available.

TO BE COMPLETED BY DESIGNATED MISSION COMMANDER

1. Organization and Project Name: NOAA Ship <i>Thomas Jefferson</i> , OPR-D304-TJ-19
2. UAS platform: DJI Phantom 4
3. Dates of operation: October 7, 2019 To November 1, 2019
4. Federal Policy Checklist (Appendix I UAS Handbook) <input checked="" type="checkbox"/> Attached
5. Mission Commander: LT Calandria DeCastro
6. Pilots-In-Command involved: ENS Patrick Faha
7. What will be the operational altitude? At or below 400 feet AGL
8. What airspace coordination efforts have been accomplished and who was contacted? None
9. Brief description of operation (Scientific Objective): Obtain aerial video footage of DriX Autonomous Survey Vessel (ASV) during launching, operation, and recovery procedures. Drix and TJ Hydrographic Survey Launch (HSL) will be operating concurrently. DJI Phantom 4 will be launched off the fantail of <i>Thomas Jefferson</i> after deployment of the ASV and HSL.

10. Area of Operation (include an FAA sectional chart or provide center point latitude/longitude with radius):

Lynnhaven Roads (Potential protected water testing site 1)

36°56.808'N

76°04.936'W

~1 mile radius

York River (Potential protected water testing site 2)

37°13.534'N

76°28.014'W

~1 mile radius

Cape Charles (Potential protected water testing site 3)

37°15.707'N

76°02.553'W

~1 mile radius

False Cape (Project area)

36°39.022'N

075°13.794'W

~12 mile radius

TO BE COMPLETED BY AOC UAS STAFF OFFICER

11. Federal Policy Checklist X

12. NIF #:
19-55

13. Authorization valid:
10/18/2019 To 11/1/2019

14. Comments / Conditions:
Lynnhaven Roads (Potential protected water testing site 1)
36°56.808'N
76°04.936'W
~1 mile radius



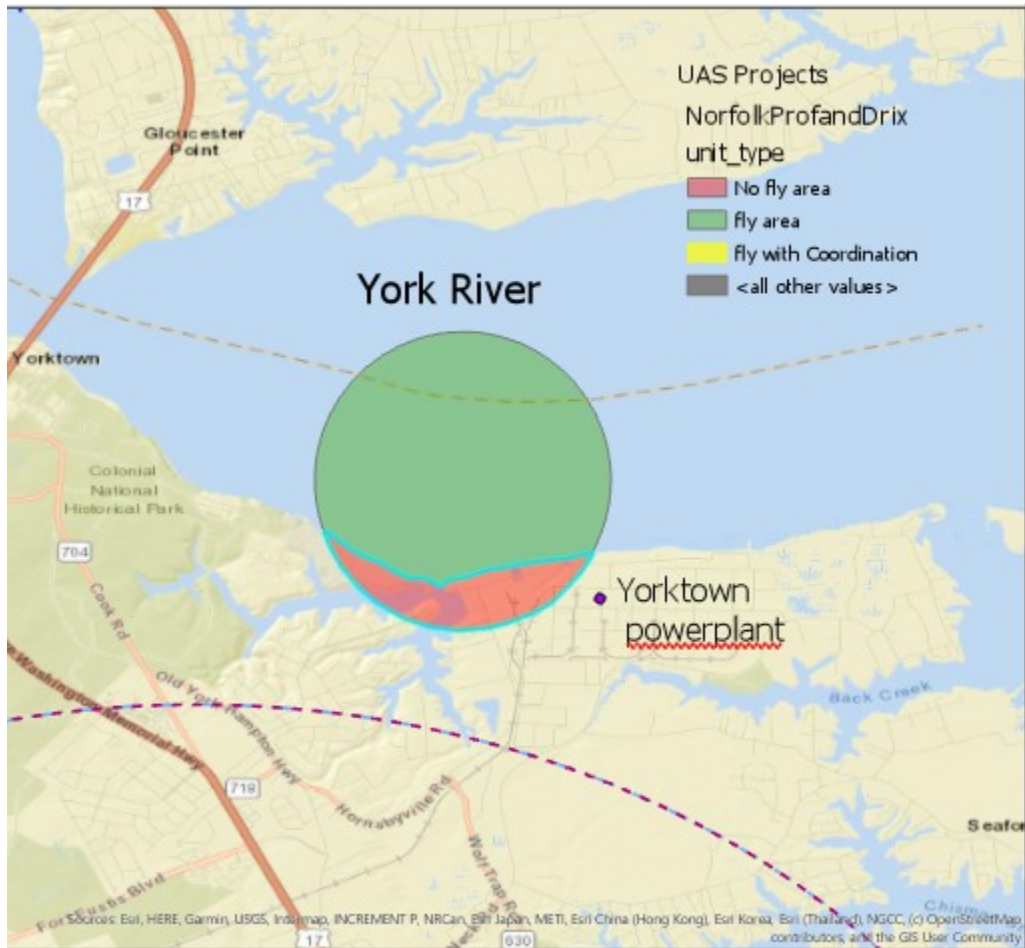
York River (Potential protected water testing site 2)

37°13.534'N

76°28.014'W

~1 mile radius

Do Not overfly the powerplant.



Cape Charles (Potential protected water testing site 3)

37°15.707'N

76°02.553'W

~1 mile radius

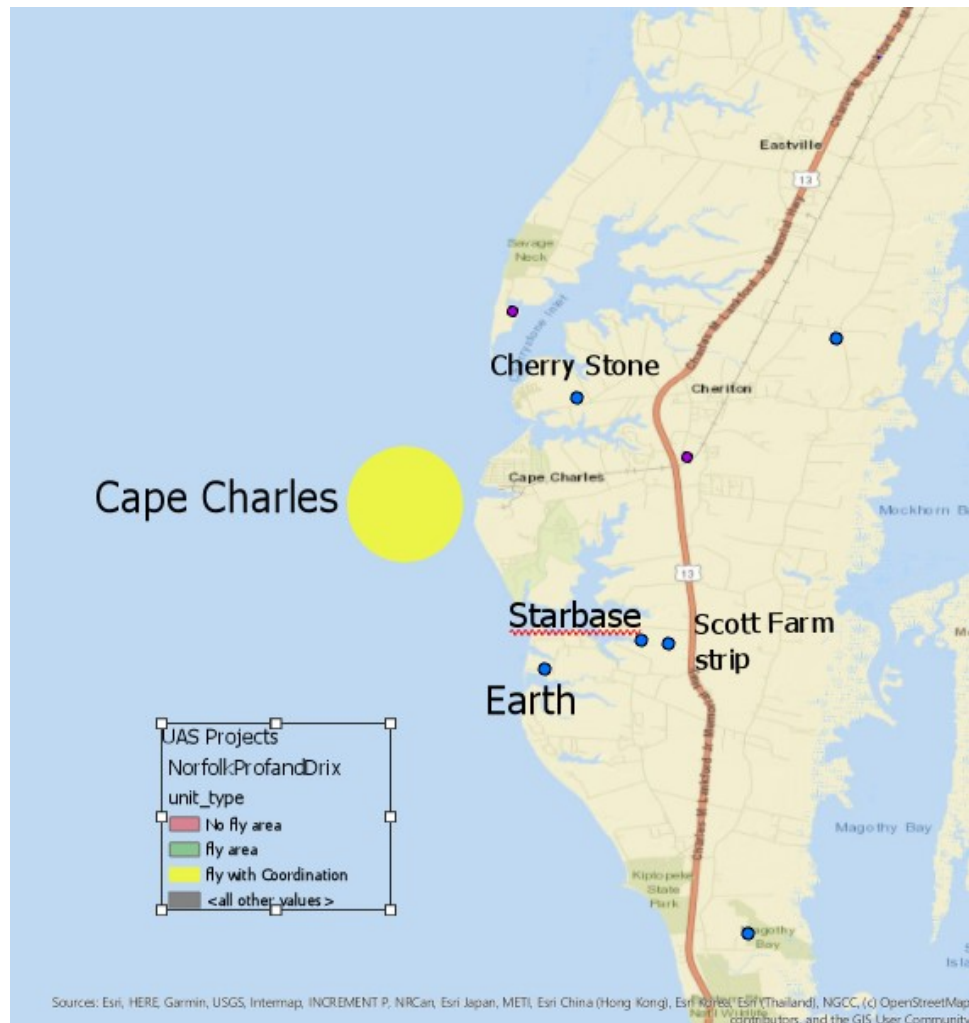
Contact/Notify the following airports

Cherry Stone 8043312405

Contact Starbase 2159681629

Scott Farm Strip 7573313615

Earth 7573311959



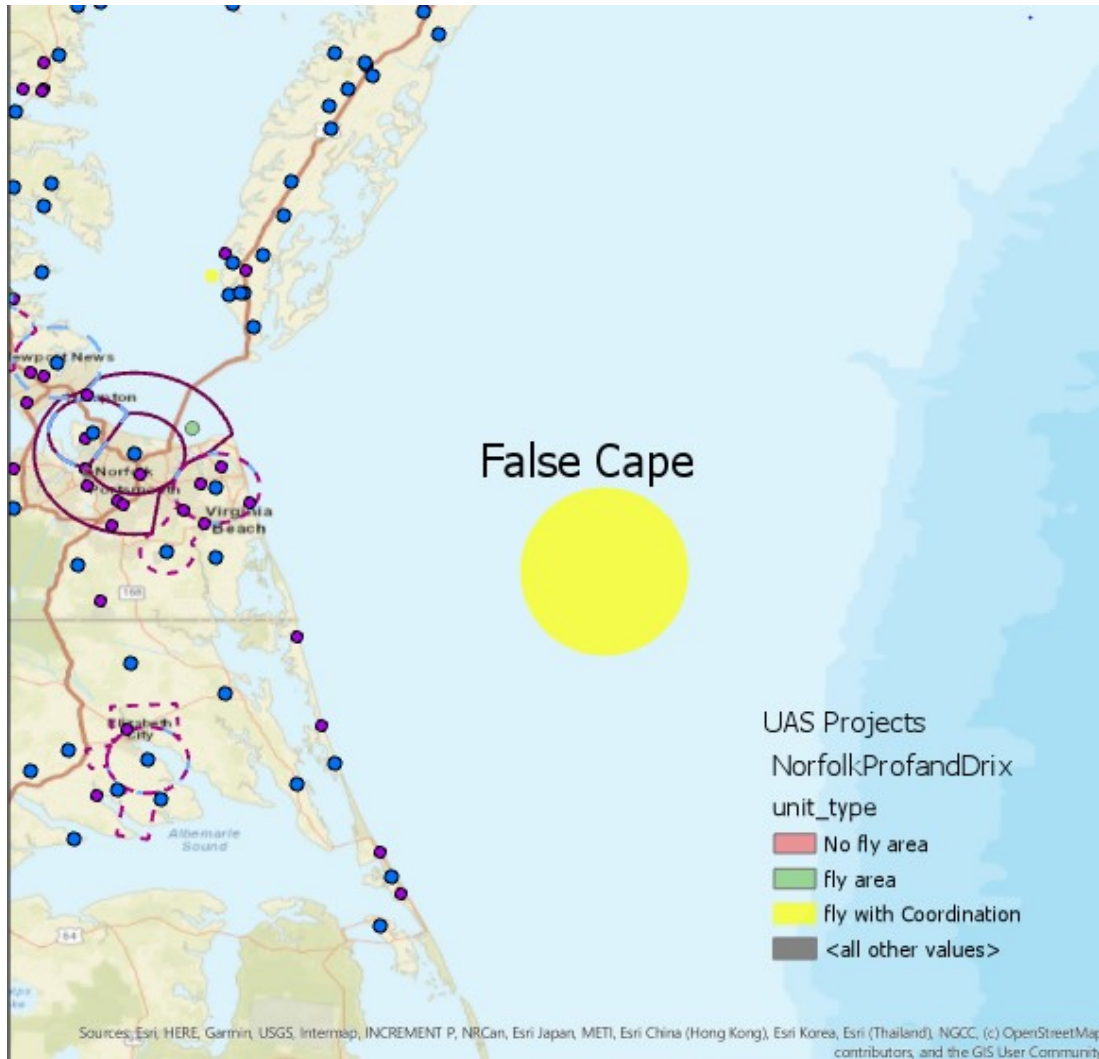
False Cape (Project area)

36°39.022'N

075°13.794'W

~12 mile radius

Notify Fleet Area Control and Surveillance Facility, Virginia Capes (FACSFAC VACAPES), Virginia Beach, VA. DSN 433-1218/1220, C757- 433-1218/1220



Approved

Conditionally Approved

Not Approved

Approving Official Signature:

Date: 18 OCT 2019



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Procedure for approval for use of AUV for Drix project

10 messages

Charles Wisotzkey - NOAA Federal

Fri, Aug 16, 2019 at 9:51 AM

<charles.j.wisotzkey@noaa.gov>

To: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>

Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>

Sharr,

The Drix peeps would like to use a drone to take video of the project. Has Doug already asked you about this?

If not, what procedure should we follow to gain approval?

- Charles

--

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

Matthew Sharr - NOAA Federal

Fri, Aug 16, 2019 at 9:59 AM

<matthew.sharr@noaa.gov>

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

Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>

I haven't heard about this yet.

A few questions for starters:

- Do they have their own drone?
- What kind of drone will be used?
- Who will be the pilot?

[Quoted text hidden]

--

LTJG Matthew B. Sharr, NOAA
Field Support Liaison - Atlantic
NOAA OCS, Hydrographic Systems and Technology Branch
439 West York St.
Norfolk, VA 23510
Office: (757) 364-7709
Cell: (570) 881-0032

Hollis Europe - NOAA Federal

Fri, Aug 16, 2019 at 10:03

<Hollis.Europe@noaa.gov>

AM

To: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>

Cc: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>, _OMAO MOA
OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

I received this email recently regarding non-NOAA pilots flying from NOAA
platforms.....

Good Talking to you. This is just for future reference. I will follow-up will CDR
Neuhaus to discuss your request.

- Flight Readiness Review (Discuss documents 220-1-5, Wide Area ORM with TO BE- Mission Commander; usually 1 hr phone call)
- Flight Authorization Memo (AOC, CO signs FAM designating office) 1-2 weeks
- Provide Licenses/Training (Part 107 training/ Original Equipment Manufacturer Training OEM)
- Flight Request/Notification of Intent to Fly - (NIF) with signed Line Office Review
- Review and approval of NIF and documentation- 2 days

The paperwork is handled by AOC but it is the mission commanders responsibility to understand and maintain records and documentation.

Very Respectfully,
LT Carrier

LT William Carrier, NOAA
Twin Otter Pilot
NOAA UAS Office
NOAA, Aircraft Operations Center
3450 Flightline Drive
Lakeland, FL 33811-2836
(863) 500-3896

LT Hollis M. Europe, NOAA
Atlantic Hydrographic Branch

[Quoted text hidden]

7 attachments



NOTICE OF INTENT TO FLY Form(V4).docx
30K



220-1-5 UAS v6.0 Eff 19 Dec 2016 FINAL.pdf
384K



2019.2.08_FRR_AFSC.docx
120K



2019.2.08_FAM_AFSC.docx
120K



2019-2020 UAS Wide Area ORM - CO Approved - 25FEB19.pdf
1693K



Line Office Review Checklist.pdf
144K



NOAA UAS Handbook.pdf
2538K

Charles Wisotzkey - NOAA Federal

Fri, Aug 16, 2019 at 10:18

<charles.j.wisotzkey@noaa.gov>

AM

To: Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>

Cc: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>, _OMAO MOA OPS

Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Ay caramba! Why do we make things so hard on ourselves?

Matt,

The Drix people will bring their own drone. Not sure yet about type/model or who the pilot will be. I'll read through the documentation Hollis provided and get back to you both.

[Quoted text hidden]

Matthew Sharr - NOAA Federal

Fri, Aug 16, 2019 at 10:23

<matthew.sharr@noaa.gov>

AM

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

Cc: Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>, _OMAO MOA OPS

Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Yeah, it's going to be a process. You/they will want to get started on this now even though it's months away.

Let us know when you have questions.

Very respectfully,

-Matt

[Quoted text hidden]

Hollis Europe - NOAA Federal

Fri, Aug 16, 2019 at 10:25

<Hollis.Europe@noaa.gov>

AM

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

Cc: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>, _OMAO MOA OPS

Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Here is what I got from Doug last week:

Sometime about the middle of next month the *TJ* is scheduled to start work on OPR-D304-TJ-19 offshore of False Cape, VA, and as part of this process they are going to be testing an IXBlue DriX ASV. I just learned that they are interested in flying a UAS to occasionally inspect or monitor the ASV. I am not aware that the *TJ* has a certified flying monkey operator at this time and Andy Armstrong from UNH who is leading the ASV part of the project doesn't expect to bring anyone qualified.

I'm bummed I can't sail/fly for this one. Not sure what they'll end up doing. Let me know if I can help.

Hollis

LT Hollis M. Europe, NOAA
Atlantic Hydrographic Branch

[Quoted text hidden]

Matthew Sharr - NOAA Federal

Fri, Aug 16, 2019 at 11:58

<matthew.sharr@noaa.gov>

AM

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

Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>

The dates of the project are now around the Oct 8 time frame, correct?

[Quoted text hidden]

Charles Wisotzkey - NOAA Federal

Fri, Aug 16, 2019 at 12:03

<charles.j.wisotzkey@noaa.gov>

PM

To: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>

Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>

The project will now start OCT 07. Rough schedule attached.

[Quoted text hidden]



DriX Trials CalendarRev2_8-14-2019.docx

28K

John Doroba - NOAA Federal <john.doroba@noaa.gov> Fri, Aug 16, 2019 at 12:48 PM

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

Cc: Matthew Sharr - NOAA Federal <matthew.sharr@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>

Let me look at my catb schedule and see how it fits in. Need to see if I can miss class, and if I miss class if it'll screw me up. Otherwise I'm interested.

Sent from my iPhone

[Quoted text hidden]

<DriX Trials CalendarRev2_8-14-2019.docx>

Matthew Sharr - NOAA Federal

Mon, Aug 19, 2019 at 1:50

<matthew.sharr@noaa.gov>

PM

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

Cc: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, Hollis Europe - NOAA Federal <Hollis.Europe@noaa.gov>, John Doroba - NOAA Federal <john.doroba@noaa.gov>

I don't mean to rain on anyone's parade here, but it looks like this is going to apply to any foreign UAS operator: https://www.faa.gov/uas/resources/foreign_operators/

In short:

The FAA does not currently recognize any foreign remote pilot certificate or equivalent, but they can receive their U.S. certification through Part 107. Alternatively, a foreign pilot is able to operate the UAS or drone under the direct supervision of a certificated U.S. remote pilot. The person acting as the remote Pilot-in-Command must have the ability to immediately take direct control of the flight of the UAS — so must be there in person.

An operator of a foreign civil aircraft must hold a foreign aircraft permit issued by DOT and comply with applicable FAA requirements before engaging in any commercial air operations in the U.S.. If the drone is registered in another country, they must submit an application to obtain a foreign aircraft permit at least 15 days in advance of the proposed start date of the operation — this can take up to 30 days. They might be able to get around this by purchasing the drone in the U.S. — not positive about this, but it will still need to be registered with the FAA.

Very respectfully,
-Matt

[Quoted text hidden]



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

UAS procedures in FFVC

7 messages

Simmons, Maria D CTR (USA)

<maria.d.simmons.ctr@navy.mil>

Tue, Oct 1, 2019 at 8:59

AM

To: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>

Good morning,

I am Maria Simmons the FFAEC UAS Coordinator, I have attached the UAS form and procedures. Within the message is the email address to get frequency approval through NMCSOLANT (NMCSOLANT_FREQUENCY_ACTION@NAVY.SMIL.MIL/NMCSOLANT_FREQUENCY_ACTION@NAVY.MIL). If you do not have a spectrum office contact NMCSOLANT to discuss the procedures. The point of contact is Janet Baker her information is listed within the UAS procedures message. Please fill out your UAS form entirely. If you have any questions of what you may need in a particular section, please do not hesitate to call or email me at any time.

Very Respectfully,

Maria Simmons

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC) Asst.
Airspace/UAS Coordinator

Office: 757-425-1852 | FAX 757-433-2035 | Cell: 757-289-9450 NIPR Email:

maria.d.simmons.ctr@navy.mil Collective NIPR Email: FFAECC@navy.mil SIPR

Email: maria.d.simmons.ctr@navy.smil.mil Collective SIPR Email:

FFAECC@navy.smil.mil

2 attachments

FFVC UAS SCHEDULING PROCEDURES MESSAGE JAN 2019.txt

 6K

 **FACSFAC UAS Request Form (2018).docx**
28K

Calandria DeCastro <calandria.m.decastro@noaa.gov> Mon, Oct 7, 2019 at 4:55 PM
To: "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>
Cc: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>

Good afternoon Ms. Simmons,

Please see attachments for our UAS operations request for the period 14 OCT - 01 NOV 2019. I had assistance from our Aircraft Operations Center in filling out this form as there were some questions I was uncertain about- please let me know if there is any clarifying information I can provide. I've also attached our draft Project Instructions for the project we will be working on, as well as the Airworthiness Certificate. Thank you for your help with this.

V/r,

[Quoted text hidden]


--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706

3 attachments

 **AWR DJI Phantom Pro v2.0.pdf**
645K

 **FACSFAC UAS Request Form (2018) NOAA Ship TJ.docx**
30K

 **Draft_OPR-D304-TJ-19_Instructions.pdf**
2170K

Simmons, Maria D CTR (USA)
<maria.d.simmons.ctr@navy.mil>

Tue, Oct 8, 2019 at 9:07
AM

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Cc: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA

Federal <nicole.chappelle@noaa.gov>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "Reiss, Curtis A LCDR USN NAS OCEANA VA (USA)" <curtis.reiss@navy.mil>

Good morning,

What times are you requesting to operate your UAS daily? I have forwarded your UAS form to our spectrum office (NMCSOLANT), the turnaround is normally 30 days. I will do my best to push the request and keep you informed. I will let you know when your UAS has been scheduled. If you have any questions or concerns please let me know.

[Quoted text hidden]

Calandria DeCastro - NOAA Federal

Tue, Oct 8, 2019 at 9:11 AM

<calandria.m.decastro@noaa.gov>

To: "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>

Cc: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "Reiss, Curtis A LCDR USN NAS OCEANA VA (USA)" <curtis.reiss@navy.mil>

Good morning,

Our normal operations occur between 0800 and 1600 daily. Our UAS operations will not occur outside of those hours. Thank you for your help with this.

LT Calandria DeCastro, NOAA
OPS in Training, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706

[Quoted text hidden]

Simmons, Maria D CTR (USA)

Tue, Oct 8, 2019 at 10:19 AM

<maria.d.simmons.ctr@navy.mil>

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Cc: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>, "Person, Leslie Morphew CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "Reiss, Curtis A LCDR

USN NAS OCEANA VA (USA)" <curtis.reiss@navy.mil>, "Walker, Milton B PO1 USN (USA)" <milton.walker1@navy.mil>

Good morning,

I received notification from NMCSOLANT that you will require frequency approval to operate as well as a DOD COTS waiver. I have attached the COTS UAS waiver memo. I have also cc'd Mr. Walker from NMCSOLANT, he will be able to assist you in the process. If you have any questions please let me know.

Very Respectfully,

Maria Simmons

KBR Fleet Forces Atlantic Exercise Coordination Center (FFAECC) Asst.
Airspace/UAS Coordinator

Office: 757-425-1852 | FAX 757-433-2035 | Cell: 757-289-9450 NIPR Email:

maria.d.simmons.ctr@navy.mil Collective NIPR Email: FFAECC@navy.mil
SIPR

Email: maria.d.simmons.ctr@navy.smil.mil Collective SIPR Email:

FFAECC@navy.smil.mil

From: Calandria DeCastro <calandria.m.decastro@noaa.gov>

Sent: Monday, October 7, 2019 4:56 PM

To: Simmons, Maria D CTR (USA) <maria.d.simmons.ctr@navy.mil>

Cc: ops.thomas.jefferson@noaa.gov; Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>; Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>

Subject: [Non-DoD Source] Re: UAS procedures in FFVC

Good afternoon Ms. Simmons,

[Quoted text hidden]

[Quoted text hidden]



Unmanned Aerial Vehicle Systems Cybersecurity Vulnerabilities

OSD070728-....pdf

889K

Calandria DeCastro <calandria.m.decastro@noaa.gov> Wed, Oct 9, 2019 at 10:34 AM
To: "Walker, Milton B PO1 USN (USA)" <milton.walker1@navy.mil>
Cc: "ops.thomas.jefferson@noaa.gov" <ops.thomas.jefferson@noaa.gov>, Casey Marwine - NOAA Federal <casey.s.marwine@noaa.gov>, Nicole Chappelle - NOAA Federal <nicole.chappelle@noaa.gov>, "Person, Leslie Morphey CTR USN COMNAVAIRLANT NOR VA (US)" <leslie.person.ctr@navy.mil>, "Reiss, Curtis A LCDR USN NAS OCEANA VA (USA)" <curtis.reiss@navy.mil>, "Simmons, Maria D CTR (USA)" <maria.d.simmons.ctr@navy.mil>, Patrick Faha - NOAA Federal <patrick.faha@noaa.gov>

Good morning Mr. Walker,

I received an email from Maria Simmons indicating that for NOAA Ship *Thomas Jefferson* to operate a UAS around W72A in the vicinity of False Cape, that we will need frequency approval and a DOD COTS waiver. She provided your contact information for guidance on the process- any insight you have will be much appreciated.

V/r,

[Quoted text hidden]

Casey Marwine - NOAA Federal

<casey.s.marwine@noaa.gov>

Thu, Oct 10, 2019 at 1:02

PM

To: Calandria DeCastro <calandria.m.decastro@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Calandria,

Have you already spoken to Mr. Walker about the COTS waiver? In my opinion we don't really fall under that memo "Military services, Combatant Commanders and Defense Agencies" It is possible for us to provide a memo saying that it is okay on our end. I believe that is what the Federal Policy Checklist provides anyways

Let me know if you need anything.

Casey

[Quoted text hidden]

--

Casey S. Marwine LT/NOAA

Twin Otter Pilot / UAS

Aircraft Operations Center

C:301-471-1683



ii. **TEMPORARY AIRMAN CERTIFICATE**

THIS CERTIFIES THAT iv. PATRICK THOMAS FAHA
v. 519 FRONT ST
APT 402
NORFOLK VA 23510

DATE OF BIRTH	HEIGHT	WEIGHT	HAIR	EYES	SEX	NATIONALITY	vi.
7/16/1991	67 IN.	150	BALD	BROWN	M	USA	

ix. has been found to be properly qualified and is hereby authorized in accordance with the conditions of issuance on the reverse of this certificate to exercise the privileges of
REMOTE PILOT

RATINGS AND LIMITATIONS
xii. **SMALL UNMANNED AIRCRAFT SYSTEM**

xiii.

THIS IS AN ORIGINAL ISSUANCE A REISSUANCE OF THIS GRADE OF CERTIFICATE

DATE OF SUPERSEDED AIRMAN CERTIFICATE

BY DIRECTION OF THE ADMINISTRATOR

EXAMINER'S DESIGNATION NO. OR INSPECTOR'S REG. NO.

x. DATE OF ISSUANCE
10/12/2019 09:09:31 AM

xi. SIGNATURE OF EXAMINER OR INSPECTOR
MANAGER, AIRMEN CERTIFICATION BR
IACRA E-SIGNED APPLICATION

DATE DESIGNATION EXPIRES

vii. AIRMAN'S SIGNATURE

XIV. CONDITIONS OF ISSUANCE

This is an interim certificate issued subject to the approval of the Federal Aviation Administration pending the issuance of a certificate of greater duration. It becomes void –

1. Upon the receipt of a certificate of greater duration to replace it;
2. Upon a finding by the FAA that an error has been made in its issuance;
3. Upon a finding by the FAA that it was issued illegally or as the result of fraud or mis-representation;
4. Upon the refusal or failure by the holder to accomplish a flight check by a Flight Standards Inspector if so requested; and
5. In any case, at the expiration of 120 days from date of issuance.

DARTDRONES



Certificate of Training

Presented to

Patrick Faha

For the successful completion of the **DARTDRONES**

Basic Flight Training Course

A handwritten signature in black ink, appearing to read 'Abby Speicher', written over a horizontal line.

Abby Speicher
Chief Executive Officer

A handwritten signature in black ink, appearing to read 'Colin Romberger', written over a horizontal line.

Colin Romberger
Chief Instructor
FAA Certi # 3698304

9/16/19

Date



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Checking in

3 messages

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Mon, Oct 21, 2019 at 11:59 AM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Hi LT Wisotzkey,

I am back from leave and wanted to check in on things. I received the videos on the DriX.

Do you have a scheduled time for beginning OPR-D304?

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

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Mon, Oct 21, 2019 at 1:08 PM
To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Hi,

specifically, can you submit a weekly report even if it's just to describe HSRR and DriX testing?

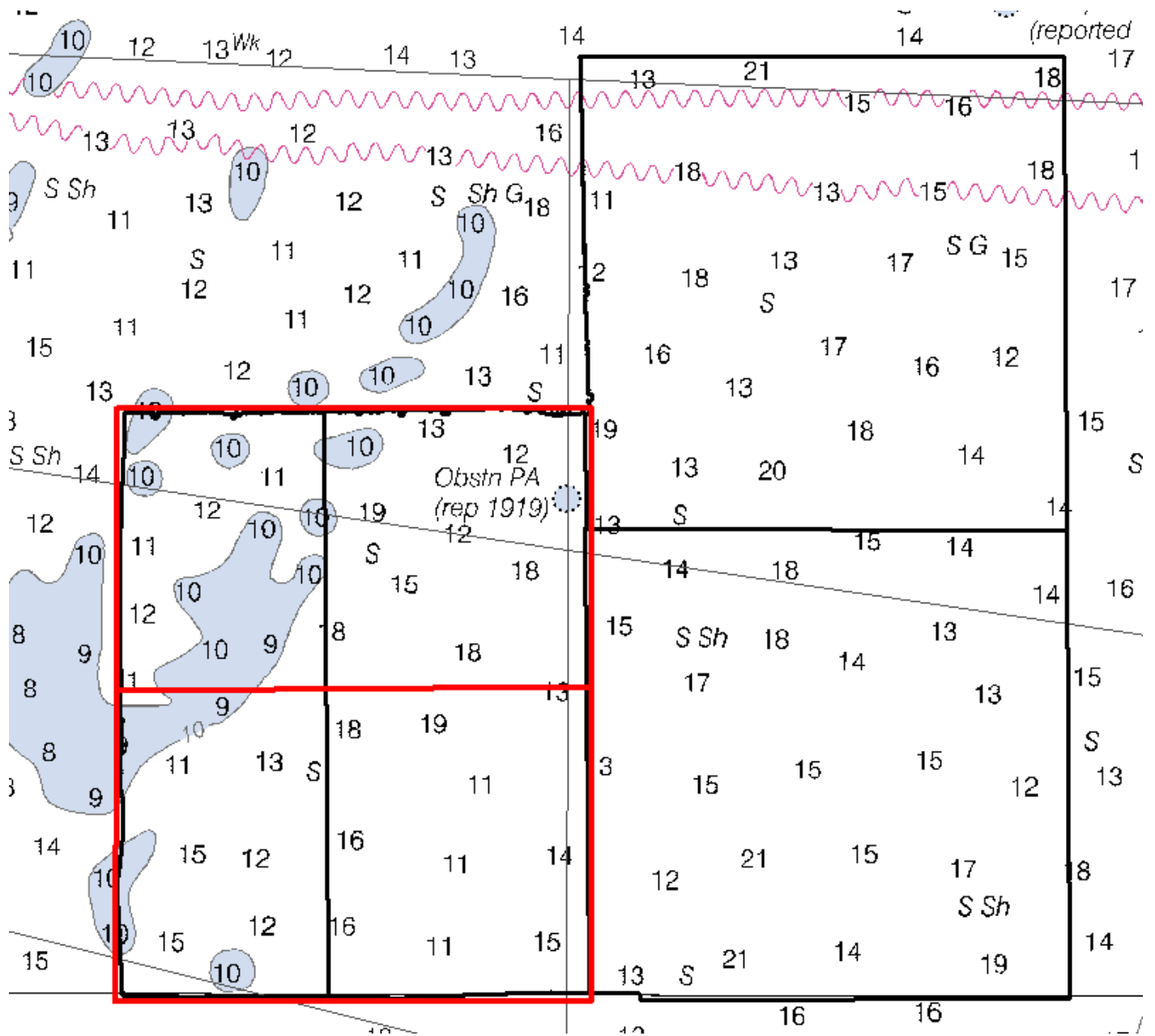
[Quoted text hidden]

Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov> Mon, Oct 21, 2019 at 3:03 PM
To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>
Cc: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Hi Doug,

We should be heading offshore shortly to begin acquisition on the project.

Would you mind if we changed the orientation of the sheets? Changes in red:



I'll give you a call in a moment.

- Charles

[Quoted text hidden]

--

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



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Checking in, Weekly Progress image

4 messages

Douglas Wood - NOAA Federal

Wed, Oct 30, 2019 at 3:32 PM

<douglas.wood@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"
<ops.thomas.jefferson@noaa.gov>

Hi LT Wisotzkey,

how are things going? It looks like you started on the first priority sheet, cool!

I just heard from Meredith about the weekly ship reports and I will forward the message. I have to concur with her that this is important as people really do look at these to see what the ships are up to:

"TJ has not delivered any Weekly Progress surfaces for OPR-D304-TJ-19. Please have them submit to https://drive.google.com/drive/folders/1hz50tfORkvLLQT_0UU4fAXRC8NGVUXyO.

Thanks

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

Charles Wisotzkey - NOAA Federal

Wed, Oct 30, 2019 at 3:39 PM

<charles.j.wisotzkey@noaa.gov>

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Cc: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>, Meredith Payne - NOAA Federal

<meredith.payne@noaa.gov>, Calandria DeCastro - NOAA Federal
<calandria.m.decastro@noaa.gov>

Doug,

We have a Weekly Ready, but had issues uploading (loss of internet and 2-step authentication on ships). We returned to port today. Cali should be able to do it tomorrow.

Meredith,

Provide both myself (charles.j.wisotzkey@noaa.gov) and Cali Decastro (calandria.m.decastro@noaa.gov) upload rights to the Drive Folder. That will prevent this problem in the future.

- Charles

[Quoted text hidden]

--

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

Meredith Payne - NOAA Federal

Wed, Oct 30, 2019 at 3:45 PM

<meredith.payne@noaa.gov>

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

Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Charles,

I have provided both you and Cali with full editing rights to the TJ Google Drive folder. Previously the TJ Ops account has had full editing rights and I have left it that way.

Sincerely,

Meredith

[Quoted text hidden]

--

Meredith C. Payne
Physical Scientist,
Hydrographic Surveys Division Operations Branch
National Oceanic & Atmospheric Administration
[1315 East-West Hwy](#), N/CS31
Silver Spring, MD 20910
240-533-0025

Visit our [StoryMap!](#)

Sign up for our [Weekly Hydrographic Ship Reports Newsletter](#)

Charles Wisotzkey - NOAA Federal

Wed, Oct 30, 2019 at 4:14

<charles.j.wisotzkey@noaa.gov>

PM

To: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>

Cc: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Image and PDF uploading now.

Meredith,

Thanks. The issue was that I no longer have access to the OPS Google Account (I just get emails forwarded to my personal NOAA account) because of 2-step authentication requirements. This is likely going to be an issue with other OPS accounts.

Doug,

Things are going OK. Demobilizing the DriX tomorrow and Friday. We completed all holidays and some crosslines within the MBES surface shown in the PDF (that image is two days old). We did have some DriX data issues related to their INS initialization and SBET processing, but most data looks usable. We plan to start SSS survey operations when we return to the working grounds - I know we started with MBES in the shallow areas, but that's what the CO wanted.

- Charles

[Quoted text hidden]



TJ Weekly Hydro Ship Activity Report - October 27 - November 2, 2019

1 message

Calandria DeCastro <calandria.m.decastro@noaa.gov> Wed, Nov 6, 2019 at 3:36 PM
To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _NOS OCS HSD
Progress Sketches <progress.sketches@noaa.gov>, _OMAO MOA OPS Thomas
Jefferson <ops.thomas.jefferson@noaa.gov>, _OMAO MOA ChiefST Thomas Jefferson
<chiefst.thomas.jefferson@noaa.gov>, Meredith Payne - NOAA Federal
<meredith.payne@noaa.gov>

TJ Weekly Hydro Ship Activity Report - October 27 - November 2, 2019

Recap

- Continued mainscheme and holiday MBES acquisition on OPR-D304-TJ-19 (ship only, due to weather and equipment issues with DriX).
- Secured from survey acquisition and returned to MOC-A on 30 OCT.
- Demobilized DriX 31 OCT and 1 NOV.
- Held Project Debrief on 1 NOV.
- Small boat inspection conducted on 1 NOV; identified cracks in hulls on both survey launches. Repairs ongoing.

Looking Forward:

- TJ is conducting Fleet Inspection activities from 5-7 NOV

-The ship will depart MOC-A on 9 NOV to continue acquisition on OPR-D304-TJ-19.
Status of launches for project TBD.

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 03 to 09 November 2019

1 message

Charles Wisotzkey - NOAA Federal

Wed, Nov 13, 2019 at

<charles.j.wisotzkey@noaa.gov>

12:07 PM

To: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, _NOS
OCS HSD Progress Sketches <progress.sketches@noaa.gov>, Douglas Wood - NOAA
Federal <douglas.wood@noaa.gov>, Meredith Payne - NOAA Federal
<meredith.payne@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 03 to 09 November 2019

Recap

- Completed OMAO Fleet Inspection and launch repairs from 04 to 08 NOV alongside at MOC-A, Norfolk, VA.
- U/W to resume survey operations on H13326 on 09 NOV.

Looking Forward:

- TJ will complete acquisition on H13326 (modified MBES only sheet limits) and will begin acquisition on H13327 (modified 100% SSS w/ MBES sheet limits) shortly after returning to the working grounds.
- TJ will conclude survey acquisition on sheet H13327 before returning to MOC-A on 22 NOV.

--

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



OPR-D304-TJ-19_11_10.pdf
306K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 10 to 16 November 2019

3 messages

OPS.Thomas Jefferson - NOAA Service Account

Tue, Nov 19, 2019 at

<ops.thomas.jefferson@noaa.gov>

2:46 PM

To: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, _NOS
OCS HSD Progress Sketches <progress.sketches@noaa.gov>, Douglas Wood - NOAA
Federal <douglas.wood@noaa.gov>, Meredith Payne - NOAA Federal
<meredith.payne@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 10 to 16 November 2019

Recap

- Resumed survey operations on H13326 on 09 November, completed holiday acquisition
- Wrapped up H13326 on 10 November (modified MBES only sheet limits) and commenced acquisition on H13327
- 12 to 13 November were weather days at anchor, resumed ops on H13327 on the evening of 13 November
- Completed crosslines on 15 November before returning to MOC-A for impending storm

Looking forward

- TJ will return to working grounds 18 November after the storm passes
- TJ will conclude survey acquisition on H13327 before returning to MOC-A on 22 November

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706



OPR_D304_TJ_19_weekly_overview_20191116.pdf
396K

Douglas Wood - NOAA Federal

<douglas.wood@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Tue, Nov 19, 2019 at 2:49
PM

Thanks!

Let me know if there is anything that you need from me.

Doug

[Quoted text hidden]

--

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

Charles Wisotzkey - NOAA Federal

<charles.j.wisotzkey@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Tue, Nov 19, 2019 at 3:02
PM

Where did you send this from?

I am uploading a surface tiff now.

[Quoted text hidden]

--

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



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 17 to 23 November 2019

1 message

OPS.Thomas Jefferson - NOAA Service Account

Tue, Nov 26, 2019 at

<ops.thomas.jefferson@noaa.gov>

4:05 PM

To: _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>, _NOS OCS HSD Progress Sketches <progress.sketches@noaa.gov>, Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>

TJ Weekly Hydro Ship Activity Report - 17 to 23 November 2019

Recap

- Dparted MOC-A for to resume Leg 2 on 18 November
- Acquired additional crosslines on H13326 18 November - 19 November
- Acquired bottom samples on H13326 and H13327 on 19 November, then commenced holidays and clean up
- Data from both Klein SSS towfish has a striping artifact in the starboard side data. Additionally, there were intermittent issues with lag, and several gaps in the data (some 30+ seconds). Both Klein towfish and TPUs are being shipped back to Klein for service.

Looking forward

- TJ aims to resume launch operations on OPR-E350-TJ-19 the week of 2 December
- We will end launch operations on 20 December to allow for routine maintenance, etc. on the launches

V/r,

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322

Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706



OPR_D304_TJ_19_weekly_overview_20191123.pdf
457K



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

**(1) Request to change final sheet limits for OPR-D304-TJ-19 and
(2) search radius for PA Obstn**

2 messages

Charles Wisotzkey - NOAA Federal

Tue, Nov 19, 2019 at 2:48

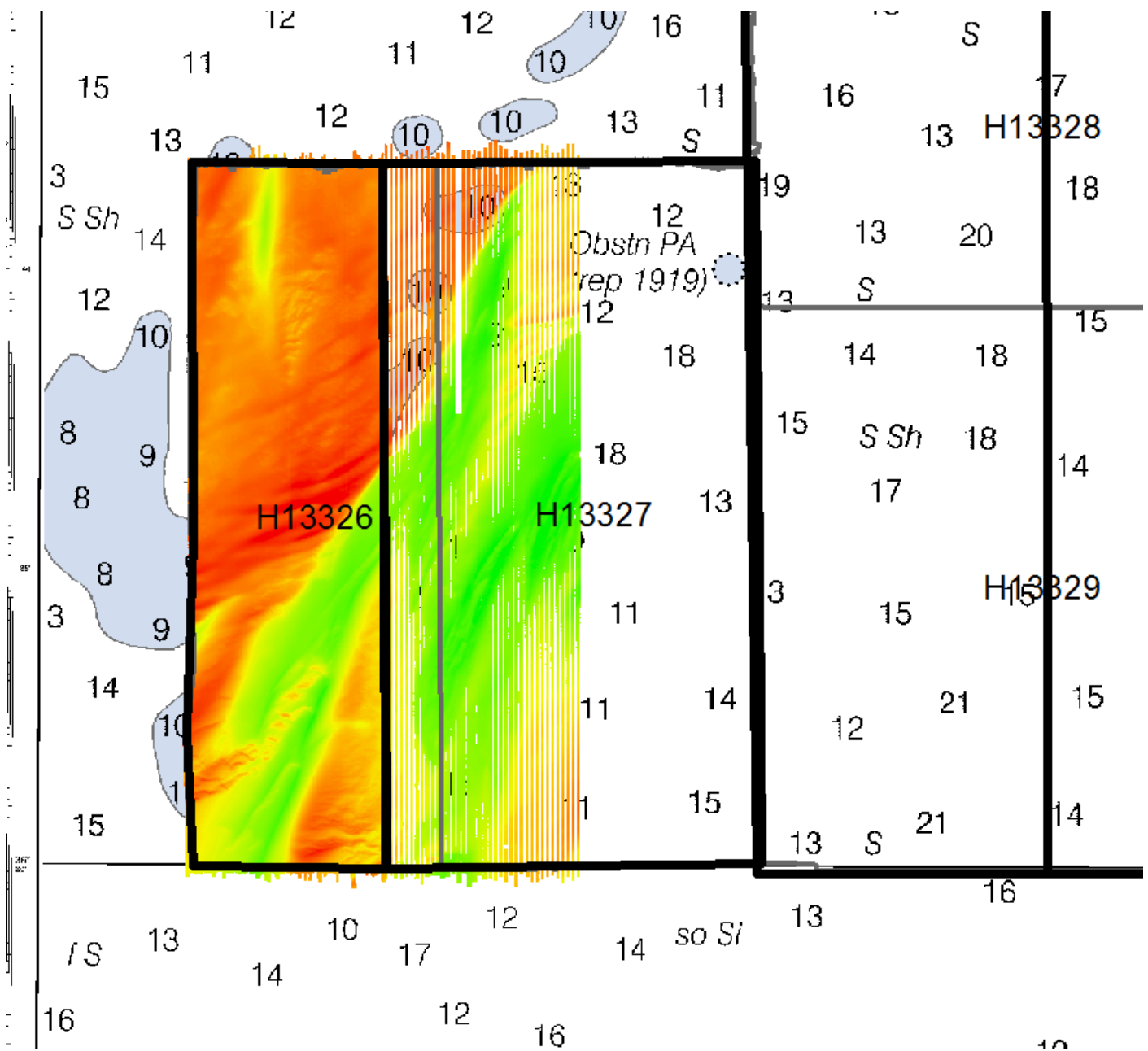
<charles.j.wisotzkey@noaa.gov>

PM

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>, _OMAO MOA ChiefST Thomas Jefferson <chiefst.thomas.jefferson@noaa.gov>, Kevin Brown - NOAA Federal <kevin.w.brown@noaa.gov>, Julia Waldsmith - NOAA Federal <julia.m.waldsmith@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <ops.thomas.jefferson@noaa.gov>

Doug,

(1) We'd like to modify the sheet limits as follows:



This will make the DR's simpler (one MBES only, one SSS w/ concurrent MBES).

(2) We are not going to get to the PA Obstn on H13347 before our ship season concludes based on our mainscheme coverage, but we want to address it before leaving (postage stamp it). What search radius should we use?

--

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

Douglas Wood - NOAA Federal <douglas.wood@noaa.gov> Tue, Nov 19, 2019 at 3:33 PM
 To: Charles Wisotzkey - NOAA Federal <charles.j.wisotzkey@noaa.gov>
 Cc: _OMAO MOA ChiefST Thomas Jefferson <chiefst.thomas.jefferson@noaa.gov>, Kevin Brown - NOAA Federal <kevin.w.brown@noaa.gov>, Julia Waldsmith - NOAA Federal <julia.m.waldsmith@noaa.gov>, _OMAO MOA OPS Thomas Jefferson

<ops.thomas.jefferson@noaa.gov>, Martha Herzog - NOAA Federal
<martha.herzog@noaa.gov>

Hi LCDR Wisotzkey,

I concur with your sheet limit change to move the line between H13326 and H13327 to the west. I agree that it will be better to not mix acquisition methods (complete coverage SSS and MBES) more than necessary within the same sheet.

An item charted as 'PA' in a chart which has a scale larger than 40,000:1 should have a search radius of 480 meters. This is an 80,000:1 scale so 480m it should be.

Retain this message as an acceptance of the sheet limit change.

Doug

[Quoted text hidden]

--

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



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

Sheet acquisition start/stop dates

2 messages

Douglas Wood - NOAA Federal

Thu, Nov 21, 2019 at 8:30
AM

<douglas.wood@noaa.gov>

To: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Hi FOO,

I am getting the survey into survey tracker updated for OPR-D304. It appears that you began ops on H13326 on October 21st; what is the date that you finished with this sheet? Also, what day did you begin on H13327? This will probably have to be based on the new border between the sheets.

Thanks

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

Charles Wisotzkey - NOAA Federal

Thu, Nov 21, 2019 at 9:15
AM

<charles.j.wisotzkey@noaa.gov>

To: Douglas Wood - NOAA Federal <douglas.wood@noaa.gov>

Cc: "OPS.Thomas Jefferson - NOAA Service Account"

<ops.thomas.jefferson@noaa.gov>

Hi Doug,

H13326: First day of acquisition was 2019-10-22; the last day of acquisition was 2019-11-20 (yesterday).

H13327: First day of acquisition was 2019-11-11; the last day of acquisition will be 2019-11-22.

V/R,

[Quoted text hidden]

--

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



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

H13326 Survey Outline

2 messages

OPS.Thomas Jefferson - NOAA Service Account

Wed, Dec 4, 2019 at

<ops.thomas.jefferson@noaa.gov>

1:15 PM






To: _NOS OCS Survey Outlines <survey.outlines@noaa.gov>, Douglas Wood - NOAA
Affiliate <douglas.wood@noaa.gov>

Good afternoon,

Attached are survey outlines for H13326.

V/r,

5 attachments

-  **H13326_SurveyOutline_M_COVR_Polygon.shp_rxl**
2K
-  **H13326_SurveyOutline_M_COVR_Polygon.shp**
16K
-  **H13326_SurveyOutline_M_COVR_Polygon.dbf**
8K
-  **H13326_SurveyOutline_M_COVR_Polygon.shx**
1K
-  **H13326_SurveyOutline.000**
10K

Brian Mohr - NOAA Federal <brian.mohr@noaa.gov>
To: "OPS.Thomas Jefferson - NOAA Service Account"
<ops.thomas.jefferson@noaa.gov>

Mon, Dec 9, 2019 at 7:06 AM

Thank you, I will get **H13326** survey outline appended into SURDEX shortly.

Brian Mohr

Data Manager
Hydrographic Surveys Division
brian.mohr@noaa.gov
(240)-533-0026
[Quoted text hidden]



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

H13327 Survey Outline

2 messages

OPS.Thomas Jefferson - NOAA Service Account

Wed, Dec 4, 2019 at

<ops.thomas.jefferson@noaa.gov>

1:16 PM

To: _NOS OCS Survey Outlines <survey.outlines@noaa.gov>, Douglas Wood - NOAA
Affiliate <douglas.wood@noaa.gov>

Good afternoon,






Attached are survey outlines for H13327.

V/r,

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706

5 attachments

-  **H13327_SurveyOutline_M_COVR_Polygon.shp**
299K
-  **H13327_SurveyOutline_M_COVR_Polygon.dbf**
8K
-  **H13327_SurveyOutline_M_COVR_Polygon.shx**
1K
-  **H13327_SurveyOutline_M_COVR_Polygon.shp_rxl**
2K
-  **H13327_SurveyOutline.000**
152K

Brian Mohr - NOAA Federal <brian.mohr@noaa.gov>

Mon, Dec 9, 2019 at 7:06 AM

To: "OPS.Thomas Jefferson - NOAA Service Account"
<ops.thomas.jefferson@noaa.gov>

Thank you, I will get **H13327** survey outline appended into SURDEX shortly.

Brian Mohr
Data Manager
Hydrographic Surveys Division
brian.mohr@noaa.gov
(240)-533-0026
[Quoted text hidden]



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

TJ 2019 Drix Project Debrief Document

2 messages

CO.Thomas Jefferson - NOAA Service Account

Fri, Mar 6, 2020 at
6:13 PM

<co.thomas.jefferson@noaa.gov>

To: Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Lorraine Robidoux - NOAA Federal <lorraine.robidoux@noaa.gov>, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov>

Cc: Val Schmidt <vschmidt@ccom.unh.edu>, Andy Armstrong - NOAA Federal <andy.armstrong@noaa.gov>, Larry Mayer <larry@ccom.unh.edu>, "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, HSTB Chief <hstb.ocs.chief@noaa.gov>

Rick, Lorraine, Megan,

Here is TJ's final write-up as well as the presentation that was given by LCDR Wisotzkey at CHC. I recommend distribution via Hydroforum and/or to the BOH.

V/r,

Bri

--

CDR Briana Welton Hillstrom, NOAA

Commanding Officer, NOAA Ship *Thomas Jefferson* (S-222)

439 W York St, Norfolk, VA 23510

cell: 520-227-9269

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

2 attachments

 **TJ 2019 DriX Project Debrief_FINAL.pdf**
1542K

 **chc2020-wisotzkey-drix_presentation_final_20200225.pdf**
9361K

Lorraine Robidoux - NOAA Federal

Mon, Mar 9, 2020 at 11:46

<lorraine.robidoux@noaa.gov>

AM

To: "CO.Thomas Jefferson - NOAA Service Account" <co.thomas.jefferson@noaa.gov>

Cc: Richard Brennan - NOAA Federal <Richard.T.Brennan@noaa.gov>, Megan

Greenaway - NOAA Federal <megan.greenaway@noaa.gov>, Val Schmidt

<vschmidt@ccom.unh.edu>, Andy Armstrong - NOAA Federal

<andy.armstrong@noaa.gov>, Larry Mayer <larry@ccom.unh.edu>, "OPS.Thomas

Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>, HSTB Chief

<hstb.ocs.chief@noaa.gov>

Thank you for sharing Bri -- and thank you to everyone involved in the project!

Megan,

Can you please coordinate with Matt Forrest to distribute to HydroForum and to schedule a review at the Board of Hydrographers?

Thank you!

Lorraine

--

Lorraine Robidoux (she/her)

Deputy Chief, Hydrographic Surveys Division

NOAA's Office of Coast Survey

(240) 533-0029 (work)

(202) 643-7172 (cell)

[Quoted text hidden]

2 attachments



TJ 2019 DriX Project Debrief_FINAL.pdf

1542K



chc2020-wisotzkey-drix_presentation_final_20200225.pdf

9361K

NOAA Ship Thomas Jefferson DriX Project Debrief

Oct 7-Nov 1, 2019, Southern Chesapeake Bay and Virginia Capes

Prepared by LT Cali DeCastro and CDR Briana Hillstrom, NOAA Ship Thomas Jefferson; and Val Schmidt, Center for Coastal and Ocean Mapping, UNH, with input from the Thomas Jefferson iXBlue onboard crew

Introduction:

Recent advances in capability of autonomous surface vehicles (ASVs) (e.g. robotic boats) have the promise of markedly increasing the productivity of the NOAA fleet in a number of operational endeavors without compromising or changing existing methods. In particular, the DriX ASV from iXBlue is the first commercially available vehicle that can match or exceed the speed of NOAA ships, acquire equal, or better, quality data, and do so for several 24-hour days at a time. Obvious applications include, among many others, hydrographic mapping and acoustic fisheries stock assessment.

This document seeks to recommend operational guidelines to ships and operators of the DriX. These guidelines are based on several years of experience at the University of New Hampshire operating all manner of other ocean-going ASVs from shore and ships of opportunity, including NOAA vessels, and direct operational experience with the DriX both at UNH and aboard NOAA Ship *Thomas Jefferson (TJ)*. This document is also intended to capture lessons learned during the TJ DriX project from an operational standpoint and makes recommendations based on the capability of the DriX as it has been tested aboard TJ in October 2019 with regard to existing sensors and telemetry systems, their availability to operators and the ability of the DriX to use them internally. As with all ASVs there is room for improvement in these technologies and an effort will be made to identify enhancements to the existing capability that would significantly improve the operational safety and capability of the system and its operation. In addition, these capabilities are evolving rapidly and adjustments to these recommendations will invariably be necessary to take advantage of them.

Project Summary and Background:

The UNH CCOM/JHC was awarded a grant from NOAA OMAO to work with iXBlue to design and build a deployment system for their DriX ASV to be launched from TJ's existing davit system. An iXBlue team visited TJ while the ship was in Puerto Rico in 2018 to make davit measurements and inform the design. The resulting DriX Deployment System (DDS) and modified davit cradle was designed specifically to deploy and recover the DriX from TJ's Vest Davit. The DDS and DriX were tested with UNH Teams in New Hampshire during the summer of 2019 and the whole system was commercially delivered via trailer to Norfolk, VA, in October 2019. The main objectives for this project aboard TJ were to: (1) deploy and recover DriX from TJ alongside a pier, underway in protected water, and underway in unprotected water offshore; and (2) acquire high quality, deliverable multibeam data with the DriX in conjunction with TJ real-time data acquisition integrated with the ship's processing and delivery pipeline.

Pre-Project Preparation and Outfitting:

The DDS and DriX were easily delivered to NOAA's Marine Operations Center in Norfolk, VA, and installed aboard TJ using TJ's aft crane with minor cradle and davit wire adjustments. TJ's engineering department adapted ship's power to supply 230V to the DriX and 110V to the DDS and built a temporary

catwalk for easy and safe access to the DDS and DriX. A temporary boom arrangement was mounted forward of the davit by the iXBlue team.

For the purposes of this project, the davit retrofit was adequate, straightforward to install, and functioned as intended. However, a larger discussion is needed regarding the design of the DDS (and potentially, the davit), if we were to pursue future utilization of the DriX in a more permanent capacity. Examples of design modification considerations include:

- Adjusting the lift points of the DDS to eliminate the hoop and allow use of the tensioners when launching in larger sea states; or
- Alternatively, allowing the davit falls to be wholly disconnected from the DDS when deployed alongside for DriX deployment and retrieval, with increased protection from considerably larger sponsons. (1 m diameter+)
- Widening the sponsons on the DDS and modifying it to provide an improved ride angle so that the DriX can back out with sufficient clearance from the ship while stationary or underway (eliminating the need for the mooring whips while stationary and improving the angle relative to the ship at which the DDS is towed while underway).

Operational Risk Management:

During the planning and staging phase of the project, the UNH and DriX team leadership met with *TJ* command to discuss potential hazards, mitigating factors, and the overall management of operational risk. These findings were later discussed with the DriX team and crew as a whole in an effort to raise awareness of the experimental nature of the project and the inherent risk it entailed.

Each evolution began with a Safety and Operations Brief led by the *TJ* Operations Officer. UNH developed a NOAA GAR Evaluation specific to DriX operations (*see Appendix A*), and trained the DriX team on its use. The team leader was responsible for completing the assessment prior to operations and discussing the operational risk with all involved personnel. Additionally, if the plan involved small boat operations, the Coxswain would discuss the small boat GAR score.

Unique considerations for DriX emergency recoveries included: *TJ*'s likely response time either with an HSL or FRB, DriX drift rate, ability for ship to tend the DriX in the area to which it drifts while the ship readies a response. These considerations are especially important when operating in protected waters, which are invariably close to hazards and for night ops when a response would likely be delayed.

Launching and Recovering DriX and DDS:

Prior to commencing operations, the DriX team, UNH and *TJ* crewmembers held a meeting to discuss procedures for launching and recovering the DriX and DDS. However, the process was still largely experimental and evolutionary.

Having ample time to train crewmembers on linehandling procedures, management of the boom and mooring whips, and operation of the DDS was crucial. The ship spent a total of seven days conducting launching, recovering, and emergency recovery trials with the DriX and DDS under varying conditions ranging from light and variable winds to gale force winds.

During these trials, the DriX team developed a pre-deployment checklist which they utilized throughout the project to ensure the all components of the DriX and DDS were functioning as intended prior to deploying. This allowed most of the troubleshooting thereafter to occur while the DriX and DDS were still in the cradle in a controlled environment (as opposed to at the rail, alongside, or in the water, where access to the systems is considerably more difficult).

IXBLUE

05 – Davit deployment

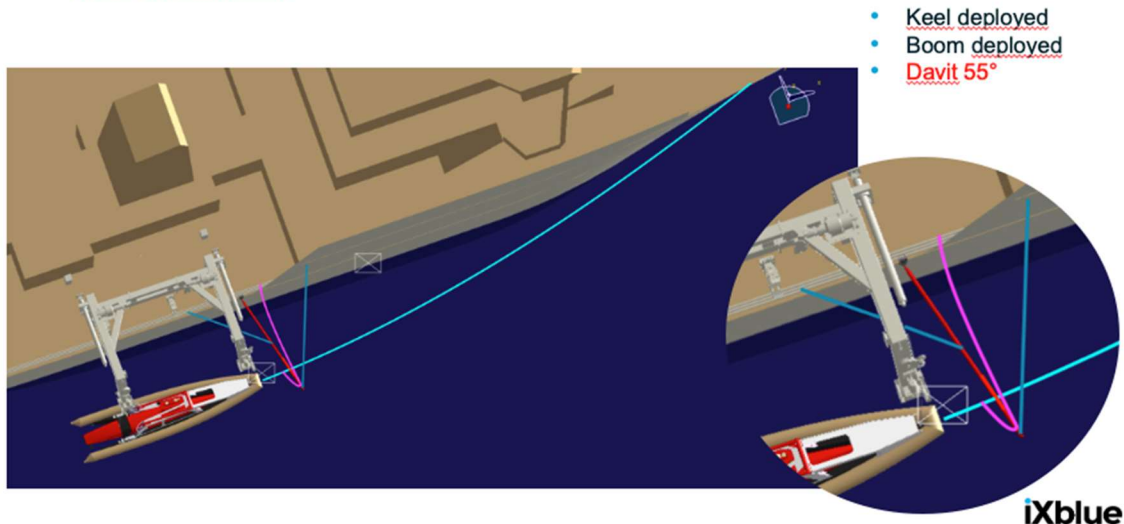


Figure 1. iXblue conceptual drawing of DriX deployment for these trials. A 5-m “painter boom” (hereafter called “boom”) (red) provided a mechanism to tow the DDS away from the ship’s hull. The athwartship’s position of the tow line (blue) could be adjusted by a second line (magenta) passing through a pully at the end of the boom and secured to a second pully through which the tow-line was passed.

The following are some of the lessons learned about launching and recovering of the DriX and DDS:

- A speed of ~3 knots appeared to be ideal for launching and recovering with the existing system. Faster speeds created bow wake that caused unnecessary pounding motion on the DDS and DriX bow.
- The maximum deployment and recovery environmental state is roughly similar to a launch (15 kts of wind, 2-3 ft)
- Launching and recovering while the ship was stationary was more difficult, as the stern of the DDS tended toward the ship and required use of the mooring whips and boat hooks to tend the stern of the DDS away from the ship.
- The mooring whips were cumbersome, required 2 additional line handlers, and were only marginally effective at keeping the DDS away from the ship. Additionally, if the line was not adjusted exactly right, it interfered with the DriX entry into the DDS and required someone with a boat hook to hold the line clear.
- The boom’s placement was too far aft and hence too close to the davit and towed DDS causing several issues. On one occasion a roll of the ship to Port caused the boom to swing up, and because the boom was too close to the DDS there was no accommodation in the tow line for

this vertical movement. The vertical swing of the boom lifted the bow of the DDS out of the water until the shackle holding the tow adjusting line broke. The lack of accommodation in this line proved to be a limiting factor for deployment in seas.

- The temporary nature of the boom required complex rigging including several lines/blocks and tackle. Operation of the boom was awkward, and required 1-2 additional line handlers trained to deploy it.
- When launching and recovering in higher sea states, the davit operator needed to put a lot of slack in the davit cables to prevent the DDS from bucking, which required someone with a boat hook to hold the cable out of the way as the DriX maneuvered past it. In future, it is recommended to work with Vest to consider options for being able to use the davit tensioners.
- After several DDS issues were encountered during deployment or recovery evolutions (primarily with the hoop and gate mechanisms), the iXBlue team started doing DDS “prechecks” in which they checked all major components of the DDS (gate, hoop, etc) prior to deployment of the DDS for DriX deployment or recovery. Most DDS issues discovered during the pre-deployment check could be resolved by manually resetting the controls, which was most safely and reliably accomplished with the DDS in the cradle, as the manual reset is not easily accessible once the DDS is in the water.
- Having the option to manually lower and raise the keel was beneficial because there were several issues in which power limitations caused problems raising the keel.
- Developing clear, concise, and informative communications between the deck, the DriX team, and the bridge was challenging but was eventually accomplished successfully.

UNH created a draft Ship-Specific Instruction (SSI) titled *DriX Launch, Recovery, and Operations* based off existing launch deployment SSIs. The document was further developed by the ship and is under review, (see *Appendix B*). Additionally, aerial footage of a full evolution of deployment and recovery was obtained during the project and is available for informational purposes.

Survey Operations:

The overarching goal of the project was to accomplish concurrent data acquisition with the ship, the survey launch, and the DriX; and this goal was realized on Days 16 and 18 of the project. In the time leading to this accomplishment, the ship and DriX team overcame a multitude of equipment, telemetry, electrical, and software configuration issues. Ultimately, operations were suspended on Day 20 for the remainder of the project due to a damaged DriX component that could not be repaired in the cradle, which was resulting in excessive vertical keel motion (in the older model DriX vessel aboard TJ, the keel was kept down by weight alone – there was no locking mechanism that mechanically holds it in place in the down position as has been designed in newer prototypes (this hull has since been retrofitted)).

Some of the operational lessons learned are listed below:

- The manning requirements for deploying the DDS in the current configuration are: a Deck Boss, a Safety Observer, a Bow Line Handler, a Stern Line Handler, 2 Boom Operators, a Painter Tuning Line Handler, 2 Mooring Whip Handlers [if stationary], and a Davit Operator. With design improvements to the boom, the boom tenders could likely be eliminated or accomplished by the bow line tender. Once the DriX is deployed away from the ship, a surveyor on watch and a

pilot on standby was required to operate it, with additional lookout provided by bridge personnel. Incorporating those roles into existing TJ survey withstanding duties would allow TJ to realize operational efficiency gains from the DriX.

- Outfitting and integrating the DriX aboard TJ to get it to an operational point took about 20 different iXBlue personnel aboard at various times during the project. As TJ could only accommodate five people overnight, TJ HSL shuttled additional personnel as needed from shore during the day as the project evolved. The operational overhead associated with this slowed progress, but ultimately was necessary to accomplish the project.
- In discussing the maximum distance the DriX could operate from the ship, it was determined that several factors come into play: traffic in the surrounding area, proximity of obstructions, ability of bridge to monitor it, telemetry limits, prevailing weather conditions, and sound speed variability in the area as the ship's CTD casts were used to correct the DriX multibeam data. The maximum range accomplished during this project was ~8000 meters, but was in some cases too far for the sound speed variability, causing some artifacts. Follow-along mode was never embraced operationally due to the variability of the ship operations (Hypack crashes, deploying and recovering MVP, turning at different speeds from the DriX).
- Working out communications between the DriX operators in the plot room on the main deck and the OODs on the bridge required effort and evolution. DriX operators are used to be in ear-shot of the bridge and the deployment area, speaking French. They were asked to speak English when discussing their troubleshooting and pre-launch checks over the radio so all can understand what is going on, and communicate everything the DriX is going to do to the bridge (if not ask permission) before they executed it.
- The most important consideration for conditions is the ability to recover the DriX in case of a malfunction, and contingencies for if conditions are not conducive to recovering (see the Emergency Recovery section below.)
- During the early stages of operations, several components of the DriX and DDS malfunctioned; the DriX team did an excellent job of identifying the issues and providing a solution. They were prepared with spare parts for most of the items requiring replacement. A majority of the issues discovered early on were resolved immediately, or by the start of operations the next day. Sourcing parts in the U.S. may be a consideration.
- On the first day at anchor, the DriX ran circles around the ship to test telemetry and found that we lost the link within a 15 degree sector just port of the bow, but only inside 300 m or so of the ship. It's likely due to an occlusion by the platform at the top of the stack where the MBR is mounted at the aft STBD side. Easy to work around operationally and fix in the future. Later tests in the York River presented another occlusion at the stern of the ship that was not seen in these initial tests. After these tests the DriX experienced intermittent drops in both WiFi and MBR telemetry throughout the project, sometimes not related to this initial evaluation. Overall, dropouts were less frequent and of shorter duration if the DriX was further from the ship. To aid in anticipating telemetry dropouts and troubleshooting this, DriX needs to record and plot SNR/link margin and used bandwidth from DriX, and this needs to be displayed in the user interface.
- The DriX User-interface is provided via a web server located on the DriX itself. This is advantageous because any computer attached to their network can display and control the DriX, providing considerable flexibility. It is not clear, however, if this architecture would allow the interface to clearly indicate when telemetry data has been lost and the displayed data is stale. It

currently does not and it was clear that operators were sometimes unclear of the state of the telemetry link, the age of the information displayed and hence, the actual state of the vehicle.

- During DriX operations, the DriX control station, the *TJ* survey team, and the bridge worked closely to execute the operational plan. This required a lot of careful coordination and clear communications, but with facilitation from UNH, it became more routine as we became familiar with the process.
- On one occasion, DriX was deployed from DDS, and in an attempt to pilot the DriX away from the ship it was piloted *between* the DDS and the ship. An attempt by the pilot to reverse was unsuccessful because of an engine safety feature that prevents a rapid reverse bell from forward bell without letting the engine RPM slow. (The engine just stays in neutral). *This engine safety feature should be modified such that the belly pack allows the operator to command a high forward bell to a high reverse bell immediately and the controller should handle the RPM/clutch synchronization automatically rather than failing to answer the reverse bell at all. THIS IS A BIG SAFETY ITEM!!!*
- The DriX AIS worked intermittently, and seemed to dropout completely when operating far from the ship. The exact range of the AIS was not determined during the project.
- The DriX is equipped with a passive radar reflector which the ship was easily able to detect on the bridge radar. The original placement of the radar reflector was on the emergency trip wire, but was moved when it was thought to contribute to an unexpected activation of the e-stop. Several additional activations occurred throughout the day and the root cause of e-stop trips was likely a misalignment of the tripping mechanism, which can trip when both pulled and loosened.
- After the Day 9 engine shutdowns, the emergency trip wire was reconfigured to only trip if the wire was under tension (it was previously configured to trip when tensioned *or* slacked). This seemed to resolve the issue.
- Radio communications should be kept to a minimum when docking the DriX to allow free and quick communications between the piloting station, DriX Operator Station and Bridge. It is expected that communications will be better as the bridge becomes more accustomed with the sequence of actions and can listen to and understand the DriX communications without interpretation.
- We were not able to accomplish a longevity run with the DriX (>24-hour DriX operations, including an overnight run). Additional coordination and careful monitoring of the DriX by the bridge team visually and by radar would be critical to the success of overnight operations. Notably, DriX has no radar itself.

Survey:

A total of 168.13 linear nautical miles of survey data was acquired by the DriX on OPR-D304-TJ-19. The DriX team and *TJ* survey department developed a workflow for the ship to process DriX data in accordance with the Hydrographic Surveys Specifications and Deliverables.

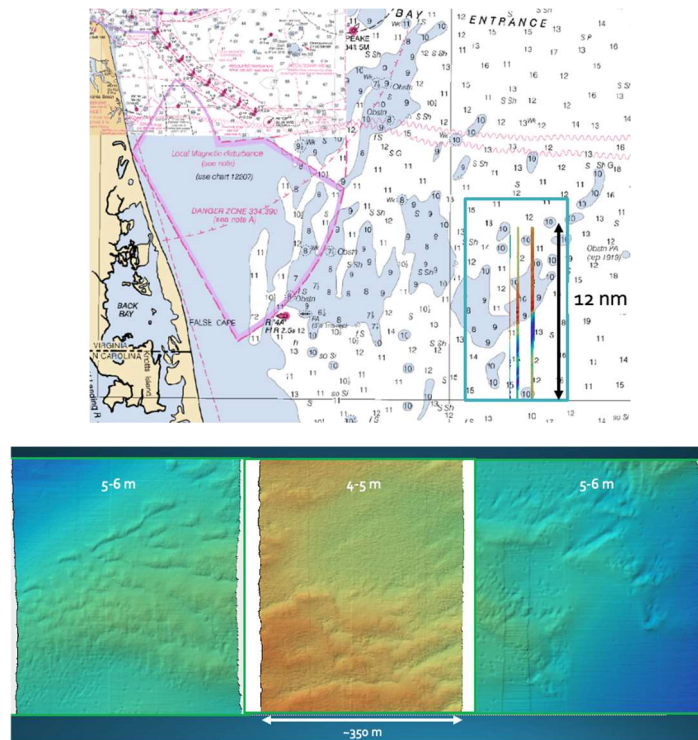


Figure 2. DriX survey lines in the approaches to the Chesapeake with representative segments of data.

Lessons learned for acquiring and processing DriX survey data are listed below:

- DriX SBETs were processed in WGS84; we were unable to process the DriX GNSS data in NAD83. Consequently we will be requesting a waiver to submit the data in WGS84. However, the surface products were delivered in NAD83.
- The DriX Team used Qinsy to monitor survey coverage (similar to how we use Hypack) and SIS for data acquisition. This kept the processing workflow simple, and in line with our standard operating procedures.
- The ship was responsible for taking MVP casts throughout the project. The .abs and .asvp files were then shared with the DriX team via Google Drive.
- When acquiring data concurrently with the ship, we aimed to keep the DriX running a parallel survey line approximately abeam of the ship.
- In the future, having the *TJ* survey team observe the DriX acquisition during survey operations would benefit both teams in understanding each other's standard operating procedures.
- When asked about weather limitations for surveying, the DriX team stated that they are unlikely to see data quality issues due to weather under the conditions that the DriX is able to safely deploy and recover in.

Emergency Recovery:

Perhaps the most robust discussion of lessons learned surrounds the topic of recovering the DriX when it is unable to maneuver under its own power. During alongside trials, several members of *TJ* crew were familiarized with the procedures for bringing DriX under tow, utilizing the "Shark Fin" on the bow of the

DriX to catch a monkey's fist. However, the manning limitations, recovery vessel capabilities, and weather conditions under which recovery was possible weren't adequately determined until we were faced with challenging circumstances and really tested our operational limits.

Some of these discoveries are listed below:

- The hydro survey launch (HSL) alone is not a viable recovery platform for the DriX due to the height of the freeboard and the interference with the HSL house and the DriX tower. The HSL can be used to capture and stern tow the DriX to prevent it from drifting into undesirable locations, but is not suggested for hip-tows or for bringing the DriX alongside the ship. This proved to be beneficial when the DriX lost power in the York River and was adrift in a heavily trafficked area. The launch was able to take control of the DriX and buy the ship time while we formulated a plan for getting the DriX back into the DDS.
- The best option for bringing the DriX to a hip tow and maneuvering it to the DDS is to use the Fast Rescue Boat (FRB). The FRB is intended to be reserved for emergency situations, which having the DriX dead in the water was deemed to be. Having three people on the FRB is ideal (a coxn, a line handler, and a DriX line handler).
- An event occurred in which the DriX operator did not fully understand the FRB radio communications during a recovery of accidental e-stop tripping and pulled away from the FRB before the lines were fully free. One of the D-rings on the stern of the DriX was pulled out of the hull. In post mission debrief it was made clear that during such a recovery the DriX must be placed in a mode in which the clutch is disengaged (docking mode) until a clear call from small-boat operator is made indicating that the DriX is well clear.
- The MOC-A work boat was brought aboard as a secondary option for recovering the DriX. It wasn't utilized this project because the FRB was deemed to be a more suitable platform for the situations that arose.
- The DDS was rigged with a recovery line, which clips to the bow of the DriX and is used to guide the DriX into the DDS without its own propulsion. Originally, it was rigged to a boat hook, which the recovery boat crew had to retrieve in order to make the line off to the DriX. We determined a more practical solution was to keep a coil of extra line from the stern of the DDS aboard the ship and pass the line and clip down to the recovery boat.

Recommended Future Steps:

- Incorporate TJ crew into the in-depth maintenance and running of the DriX to better understand the feasibility of using an OMAO-only team to operate the DriX independently of the iXBlue pilot and surveyor.
- After DriX reliability improvements are made (water intrusion prevention with respect to the electronics placement, improved electrical charging systems, etc) pursue endurance/longevity survey runs of the DriX from the ship to better understand actual efficiency gains of surveying with a DriX in tandem with TJ.
- Improve the DDS design to ride farther away from the ship during deployment and recovery of the DriX into the DDS.

Conclusion:

The TJ crew found the DriX to be a well built, efficient mapping ASV with enormous potential for NOAA hydrographic surveying, and this project was a major step forward in figuring out how to deploy and recover an autonomous light-weight carbon fiber vessel next to a large steel ship in seas. Overall, the primary goals of the project – to deploy and recover DriX from TJ alongside a pier, underway in protected water, and underway in unprotected water; and to acquire high-quality multibeam data in conjunction with TJ data acquisition – were accomplished. The TJ and DriX crew learned a tremendous amount about the operational capabilities and limitations of the DriX used in this capacity from a large survey ship. The two teams were able to come together to overcome the inherent challenges of this groundbreaking technology and open up the discussion about what the future holds for autonomous survey operations within NOAA.

Operational Risk Assessment Form

Autonomous Survey Vessel Operations

GAR Evaluation Scale

Rate the following where: 0 = no risk and 10 = the highest risk

RESOURCES: _____

ENVIRONMENT: _____

TEAM SELECTION: _____

FITNESS: _____

WEATHER: _____

MISSION COMPLEXITY _____

TOTAL: _____

GREEN	(6-23):	GO, LOW RISK
AMBER	(24-44):	USE EXTRA CAUTION
RED	(45-60):	STOP, HIGH RISK

NOAA Risk Assessment Considerations

Autonomous Survey Vessel (ASV) Operations

1. RESOURCES: ASV and Equipment, Supervision, Communications, and Support. Is the ASV adequate for the mission? Is it properly equipped with operational and safety equipment? Are the ASV, Operator Station, Telemetry Systems and other equipment fully functional and up-to-date? Is there adequate oversight and supervision for this kind of ASV, mission, and mission equipment? Is a communications plan in place? Is back-up or rescue available?

2. ENVIRONMENT: Is ASV likely to encounter other vessels? Are the vessels it is likely to encounter able to be sensed by the existing systems? Is the mission environment inherently hazardous (like a surf zone, ice, rocks, uncharted or shallow water, etc.)? Is it remote or inaccessible to rescue boats? Is it a new environment for this kind of mission, or for the crew? Will boat traffic, debris, or current impact operations? At what Level of Autonomy will the ASV and operators manage this environment?

3. TEAM SELECTION: Experience, Training, and Familiarity. Have the crew and mission personnel performed this kind operation before with this kind of ASV and equipment, and with each other? Have they operated in this environment before? Is the mission or mission equipment new or un-tested? Is everyone properly trained for this mission?

4. FITNESS: Physical and Mental. Is the team, including deck crews and small-boat operators who may be called on to support operations, well rested and ready to work? Does everyone understand the mission, and are they capable of performing it? For multiple-day missions, are there enough crewmembers to allow adequate rest periods and safe manning? Will weather, stress, or living conditions pose mission, safety, or crew exposure/fatigue problems?

5. WEATHER: Are current and expected weather conditions acceptable? What are the likely effects of the expected weather on the mission and safety? Does it pose a problem to the gear that will be used or the performance of sensors aboard the ASV that are relied upon to achieve a desired Level of Autonomy? Is there a plan to mitigate hazards or mission failure, or safely cancel, if the weather is worse than expected?

6. MISSION COMPLEXITY: Is the mission or mission equipment complicated, difficult, new or experimental? Is it a multi-unit operation or dependent on other agencies? Is it high profile, stressful, or time sensitive? Will mission equipment restrict the boat's maneuverability, affect stability, or pose a hazard to other traffic? Does the operation carry inherent risks (like towing divers or going into the surf)?

(These are only guidelines. Actual considerations under each category should be adapted to meet the operational requirements of each region or line office.)

	NOAA Ship <i>Thomas Jefferson</i> (S222)	DOCUMENT NO. 1102-XX TJ	VERSION 1.0	
		EFFECTIVE DATE October XX, 2019		
	AUTHORIZED BY: /s/ CDR Briana Hillstrom, NOAA		REVIEW DATE October XX, 2020	
	CDR Briana W. Hillstrom, NOAA Commanding Officer		RESPONSIBLE POSITION Commanding Officer	

iXBLUE DriX LAUNCH, RECOVERY and OPERATIONS

1. PURPOSE

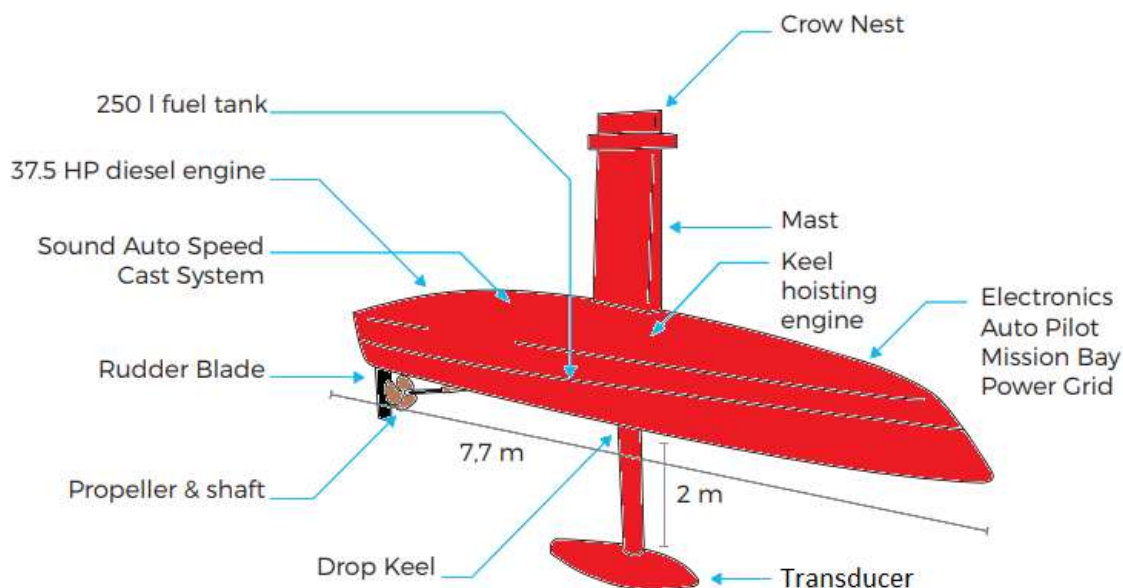
- 1.1 To provide the minimum requirements for the shipboard launch, recovery and operation of the DriX ASV.

2. SCOPE

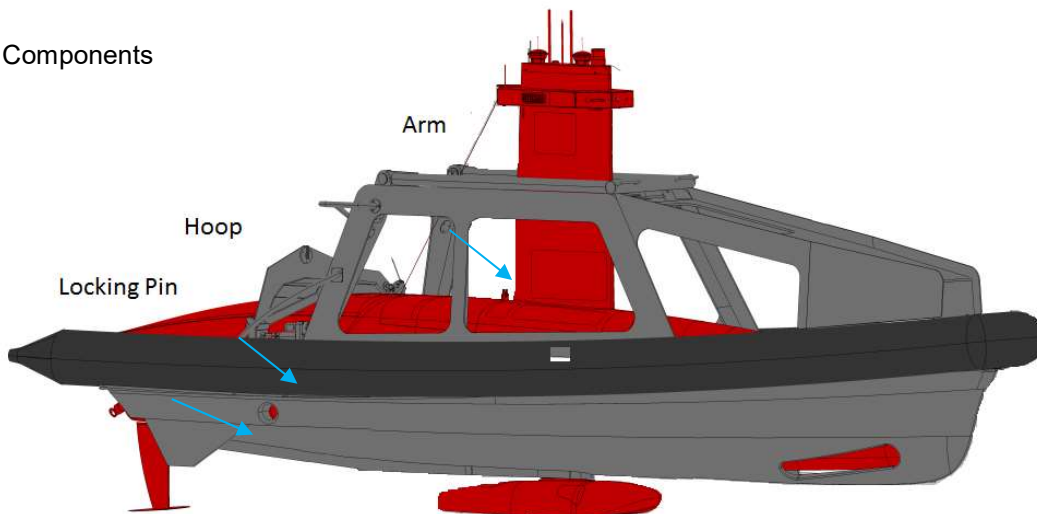
- 2.1 This procedure applies to *NOAA Ship Thomas Jefferson*.

3. PROCEDURES AND RESPONSIBILITIES

- 3.1 The DriX autonomous surface vehicle (ASV) is a robotic vessel for unmanned hydrographic survey. The DriX is accompanied by the DriX Deployment System (DDS), which is a rubber-hull-inflatable-boat (RHIB) docking system. This document provides procedures for launch, recovery and operations of the DriX.
- 3.2 DriX Components



3.3 DDS Components



3.4 The CO shall develop SSIs for this procedure.

3.5 The Commanding Officer (CO) shall ensure DriX launching and recovery operations are conducted in compliance with this procedure, the NOAA Small Boat Standards and Procedures Manual (NSBS&PM) and the OMAO Supplement to the NSBS&PM where applicable.

DriX operations are conducted at the discretion of the CO.

3.6 Launching the DriX and DDS

- Conduct pre-brief and operational risk management assessment prior to any DriX operations (generally 15 minutes in advance). Line handling, deck, DriX control, and tender/support boat responsibilities (if applicable) shall be assigned for each evolution, and the Plan of the Day will be discussed for all hands involved.
- The operational brief is normally led by the Field Operations Officer (FOO), safety concerns are addressed by the Executive Officer (XO).
- Completion of a float plan for tender/support boat operations, including operational risk assessment with a GAR score, shall be completed by the Cox'n. Operational Risk Management and GAR score for DriX operations shall be completed by the DriX team.
- External conditions under which the DriX must be recovered (deteriorating weather, inability to launch tender/support boat, etc.) shall be identified and discussed.
- Ensure communication schedule, modes of communication, area of operation, location of the ship/safe harbor and recall procedure is fully understood by all members of the team.
- Engineering, launch cox'n and crew, and DriX team members shall complete all pre-deployment inspections and/or checklists for launching equipment and gear including davit control station, winch motors, cables, and hydraulic hoses in accordance with department head instruction and the Small Boat Manual. Any malfunctioning or sub-optimal systems on the DriX and the implications of their state shall be identified and discussed.
- The Safety Observer (XO or designee), Deck Boss (Chief Bos'n, BGL, or designee), and DriX Operator shall ensure qualified launching personnel have been assigned their tasks and have properly donned all Personal Protective Equipment. Positions required for deployment typically includes:
 - DriX Pilot
 - DriX Control Station Operator
 - Bow Line Handler
 - Stern Line Handler
 - 2 Frapping Line Handlers (if used)

- 2 Mooring Whip Handlers (if deployment is stationary)
 - Painter Boom Handler
 - Painter Tuning Line Handler
 - Davit Operator
 - Deck Boss
 - Safety Observer
- If support/tender boat is deemed necessary for the evolution, it will be launched first in order to provide support as needed during DriX deployment in accordance with Procedure 1102-11 TJ – Small Boat Launching and Recovery.
 - The Safety Observer and Deck Boss will ensure that the area for DriX launching operations is clear of non-essential personnel.
 - If deploying underway, the Officer of the Deck (OOD) shall maneuver the ship to minimize roll and provide a lee, generally maintaining forward way at approximately 3 knots, with input from the Deck Boss and Safety Observer if necessary.
 - Prior to launching, the Safety Observer will obtain permission from bridge for deployment.
 - Launch DriX and DDS in accordance with Deck Operations and Procedure Below.
 - Deck boss or Safety Observer shall notify the bridge when launching operations are complete.

3.7 Recovering the DriX and DDS

- The Deck Boss and Safety Observer will ensure the DriX team is prepared to bring the DriX back.
- The Safety Observer and Deck Boss will ensure that the area for DriX launching operations is clear of non-essential personnel.
- If recovering underway, the Officer of the Deck (OOD) shall maneuver the ship to minimize roll and provide a lee, generally maintaining forward way at approximately 3 knots, with input from the Deck Boss and Safety Observer if necessary.
- The Deck Boss or Safety Observer shall obtain permission from bridge prior to bringing the DriX alongside and communicate to the DriX pilot when the ship is ready for the approach and recovery.
- DriX and DDS shall be recovered in accordance with the Deck Operations and Procedure Below.
- Deck boss or Safety Observer shall notify the bridge when small boat recovery operations are complete.
- If Support/tender boat was involved in the evolution, it will be recovered last to provide support as needed during DriX recovery. Support/tender boat shall be recovered in accordance with Procedure 1102-11 TJ – Small Boat Launching and Recovery.

4. DECK OPERATIONS AND PROCEDURE

4.1 LAUNCHING THE DRIX AND DDS

- When on ship's power (vice shore power), the OOD will check with the Engineer On Watch (EOW) to make sure there are two generators online and it is safe to energize the davits, then pass this information to the Safety Observer
- Connect the davit remote control to the control box under the davit and energize.
- Use the remote control to energize the HPU for the davit. Check the integrity of the hydraulic hoses and fittings for leaks and the control box for alarms once energized.
- Bridge and Deck will have positive communications about the conditions alongside for deployment. Bridge will ask "**HOW ARE THE CONDITIONS ALONGSIDE FOR DEPLOYMENT?**" Deck Boss and Safety Observer will confer and will pass to the bridge the status. Deck Personnel will communicate to the bridge "**CONDITIONS LOOK GOOD FOR DEPLOYMENT.**" Bridge will then give permission to deploy by saying "**PERMISSION TO DEPLOY THE DRIX AND DDS**" which should be acknowledged by the Safety Observer.
- Deck Boss and Safety Observer are informed when davit system is in good running order and ready.
- The Safety Observer and Deck Boss will confirm that the DriX team has readied the DriX and DDS for deployment.

- The Safety Observer may be stationed at the forward part of the davit and the Deck Boss at the after part.
- The Deck Boss ensures line, boom, and mooring whip handlers are in place and are ready to launch the DriX and DDS. This will be confirmed with the commands **“READY FORWARD”** and **“READY AFT”**. Forward line handlers will repeat **“READY FORWARD”** when ready for the boat to be deployed.
- All personnel are now focused on the deployment.
- When the Deck Boss gives the command **“SYNC UP”**, the Davit Operator will lift the DriX out of the cradle.
- When the Deck Boss gives the command **“LUFF OUT”**, the Davit Operator will luff the DriX and DDS out and over the side.
- When the Deck Boss gives the command **“SYNC DOWN”**, the Davit Operator will lower the DriX and DDS.
- When the Deck Boss gives the command **“LUFF IN”**, the Davit Operator will luff the DriX and DDS in toward the ship.
- Following a series of these commands, the Davit Operator will bring the DriX and DDS to the rail. The Deck Boss will signal **“ALL STOP”** to stop all davit action. The Safety Observer will notify the bridge, **“AT THE RAIL.”** While at the rail, the Deck Boss will say **“LOWER THE BOOM”**, signaling the Painter Boom Handler to fully lower the boom. The Deck Boss will then say, **“SHIFT YOUR LINES”**. The Bow Line and Stern Line Handlers will shift their lines to the rail cleats.
- The DriX team will then lower the keel. This can be done remotely or manually. Once the DriX team has confirmed the keel is fully lowered, they will notify the Deck Boss or Safety Observer who will inform the bridge, **“KEEL LOWERED”**.
- The Deck Boss will say **“GOING OUT”**.
- If the ship is stationary, the Deck Boss will then say **“LUFF OUT”** and **“ALL STOP”** signaling the Davit Operator to bring the DriX and DDS to an intermediate position where mooring whips can be set. The Deck Boss will say **“SET THE MOORING WHIPS”**. Once the mooring whips are secured in their holders, the Safety Observer will inform the bridge, **“MOORING WHIPS SET”**. The Deck Boss will then say **“GOING OUT”** again. If the ship is making way, this step will be skipped.
- The Deck Boss will then say **“LUFF OUT”** and **“SYNC DOWN”**, signaling the Davit Operator to bring the DriX and DDS to the water.
- The Deck Boss will say **“ADJUST THE PAINTER”**, signaling the Painter Tuning Line Handler to adjust their line. If the ship is stationary, the Mooring Whip Handlers will tend their lines as directed by the Deck Boss. The bow line will be kept tight and stern line will be kept slack. If the ship is underway, the bow line and stern line will both be kept slack to allow the DDS to ride on the painter. In both cases, the ideal position is for the stern of the DDS to be tending slightly away from the ship.
- As the DriX and DDS come to the water, the DriX team will say **“START THE FAN”** to the DriX control station, and confirm when the fan is running.
- Once the DriX and DDS are in the water, the Safety Observer will notify the bridge, **“IN THE WATER.”** The Deck Boss will ensure the Davit Operator slacks the cables enough to allow for the hoop to open.
- The DriX team will say to the DriX control station **“START THE ENGINE”**, and confirm when the engine is running. The DriX control station will then, in sequence, say **“UNLOCK THE PIN”**, **“OPEN THE HOOP”**, and **“OPEN THE ARM”**, and confirm when each of these actions is completed with **“PIN IS UNLOCKED”**, **“HOOP IS OPENED”**, and **“ARM IS OPENED”**. The Safety Observer will monitor these actions and ensure the bridge copies all radio transmissions between members of the DriX team during this evolution.
- The DriX pilot will then take control of the DriX and maneuver it out of the DDS. Once the bow is clear of the DDS, the Safety Observer will inform the bridge **“DRIX IS AWAY”**. The DriX team will inform the bridge of what control mode the DriX will be operating in (manual, autonomous, “box in”, etc.)
- The DriX team will then, in sequence, say **“CLOSE THE ARM”**, **“CLOSE THE HOOP”**, and **“LOCK THE PIN”**, then confirm when each of these actions is completed with **“ARM IS CLOSED”**, **“HOOP IS CLOSED”**, **“PIN IS LOCKED”**. The Safety Observer will monitor these actions and ensure the bridge copies all radio transmissions.
- Once ready to recover the DDS, the Safety Observer will ask the bridge, **“REQUEST PERMISSION TO RECOVER THE DDS.”**

- Once the bridge grants permission to recover the DDS, the Safety Observer will visually confirm that the hoop is closed and the pin is locked.
- The Deck Boss will say **"COMING IN"**.
- If mooring whips are being used, the Deck Boss will say **"SYNC UP"**, then signal **"ALL STOP"** at an intermediate position when the DDS is far enough from the rail to allow the mooring whips to be removed. The Deck Boss will say **"TAKE DOWN THE MOORING WHIPS"**. Once removed, the Safety Observer will inform the bridge, **"MOORING WHIPS CLEAR"**. If mooring whips were not used, this step will be skipped.
- The Deck Boss will say **"SYNC UP"** and **"LUFF IN"**, signaling the Davit Operator to bring the DriX and DDS to the rail. The Safety Observer will notify the bridge, **"AT THE RAIL"**. While at the rail, the Deck Boss will say **"RETRACT THE BOOM"**, signaling the the Painter Boom Handler to bring the boom in. The Deck Boss will then say, **"SHIFT YOUR LINES"**. The Bow Line and Stern Line Handlers will shift their lines to the inboard cleats.
- The Deck Boss will then say **"COMING TO THE CRADLE"**, then **"LUFF OUT"**, **"SYNC UP"**, **"LUFF IN"**, and **"SYNC DOWN"** signaling the Davit Operator to bring the DDS to the cradle. Once the DDS is lowered into the cradle, the Safety Observer will notify the bridge, **"DDS IN THE CRADLE"**.
- Once the davit is in the stowed position, Safety Observer will inform the bridge, **"FINISHED WITH THE DAVITS,"** which the OOD will relay to the EOW.
- The DDS is made secure for sea. The davit control is stowed and the cover replaced on the control box.

3.9 Launching the DDS to recover the DriX

- When on ship's power (vice shore power), the OOD will check with the Engineer On Watch (EOW) to make sure there are two generators online and it is safe to energize the davits, then pass this information to the Safety Observer
- Connect the davit remote control to the control box under the davit and energize.
- Use the remote control to energize the HPU for the davit. Check the integrity of the hydraulic hoses and fittings for leaks and the control box for alarms once energized.
- Bridge and Deck will have positive communications about the conditions alongside for deployment. Bridge will ask **"HOW ARE THE CONDITIONS ALONGSIDE FOR DEPLOYMENT?"** Deck Boss and Safety Observer will confer and will pass to the bridge the status. Deck Personnel will communicate to the bridge **"CONDITIONS LOOK GOOD FOR DEPLOYMENT."** Bridge will then give permission to deploy by saying **"PERMISSION TO DEPLOY THE DDS"** which should be acknowledged by the Safety Observer.
- Deck Boss and Safety Observer are informed when davit system is in good running order and ready.
- The Safety Observer and Deck Boss will confirm that the DriX team has readied the DDS for deployment.
- The Safety Observer may be stationed at the forward part of the davit and the Deck Boss at the after part.
- The Deck Boss ensures line, boom, and mooring whip handlers are in place and are ready to launch the DDS. This will be confirmed with the commands **"READY FORWARD"** and **"READY AFT"**. Forward line handlers will repeat **"READY FORWARD"** when ready for the boat to be deployed.
- All personnel are now focused on the deployment.
- When the Deck Boss gives the command **"SYNC UP"**, the Davit Operator will lift the DriX out of the cradle.
- When the Deck Boss gives the command **"LUFF OUT"**, the Davit Operator will luff the DriX and DDS out and over the side.
- When the Deck Boss gives the command **"SYNC DOWN"**, the Davit Operator will lower the DriX and DDS.
- When the Deck Boss gives the command **"LUFF IN"**, the Davit Operator will luff the DriX and DDS in toward the ship.
- Following a series of these commands, the Davit Operator will bring the DriX and DDS to the rail. The Deck Boss will signal **"ALL STOP"** to stop all davit action. The Safety Observer will notify the bridge, **"AT THE RAIL."** While at the rail, the Deck Boss will say **"LOWER THE BOOM"**, signaling the Painter Boom Handler to fully lower the boom. The Deck Boss will then say, **"SHIFT YOUR LINES"**. The Bow Line and Stern Line Handlers will shift their lines to the rail cleats.
- The Deck Boss will say **"GOING OUT"**.

- If the ship is stationary, the Deck Boss will then say **“LUFF OUT”** and **“ALL STOP”** signaling the Davit Operator to bring the DriX and DDS to an intermediate position where mooring whips can be set. The Deck Boss will say **“SET THE MOORING WHIPS”**. Once the mooring whips are secured in their holders, the Safety Observer will inform the bridge, **“MOORING WHIPS SET”**. The Deck Boss will then say **“GOING OUT”** again. If the ship is making way, this step will be skipped.
- The Deck Boss will then say **“LUFF OUT”** and **“SYNC DOWN”**, signaling the Davit Operator to bring the DriX and DDS to the water.
- The Deck Boss will say **“ADJUST THE PAINTER”**, signaling the Painter Tuning Line Handler to adjust their line. If the ship is stationary, the Mooring Whip Handlers will tend their lines as directed by the Deck Boss. The bow line will be kept tight and stern line will be kept slack. If the ship is underway, the bow line and stern line will both be kept slack to allow the DDS to ride on the painter. In both cases, the ideal position is for the stern of the DDS to be tending slightly away from the ship.
- Once the DDS is in the water, the Safety Observer will notify the bridge, **“IN THE WATER.”** The Deck Boss will ensure the Davit Operator slacks the cables enough to allow for the hoop to open.
- The DriX control station will then, in sequence, say **“UNLOCK THE PIN”**, **“OPEN THE HOOP”**, and **“OPEN THE ARM”**, and confirm when each of these actions is completed with **“PIN IS UNLOCKED”**, **“HOOP IS OPENED”**, and **“ARM IS OPENED”**. The Safety Observer will monitor these actions and ensure the bridge copies all radio transmissions between members of the DriX team during this evolution.
- The DriX pilot will then take control of the DriX. The DriX team will say **“DRIX ON APPROACH”**, and the pilot will maneuver it into the DDS. Once the DriX has fully entered the DDS, the Safety Observer will inform the bridge **“IN THE DDS”**.
- The DriX team will then, in sequence, say **“CLOSE THE ARM”**, **“CLOSE THE HOOP”**, and **“LOCK THE PIN”**, then confirm when each of these actions is completed with **“ARM IS CLOSED”**, **“HOOP IS CLOSED”**, **“PIN IS LOCKED”**. The Safety Observer will monitor these actions and ensure the bridge copies all radio transmissions.
- The DriX team will say to the control station, **“SECURE THE ENGINE”** and confirm when the engine is off.
- Once ready to recover the DriX and DDS, the Safety Observer will ask the bridge, **“REQUEST PERMISSION TO RECOVER THE DRIX AND DDS.”**

3.10 Recovering the DriX and DDS

- Once the bridge grants permission to recover the DDS, the Safety Observer will visually confirm that the hoop is closed and the pin is locked.
- The Deck Boss will say **“COMING IN”**.
- If mooring whips are being used, the Deck Boss will say **“SYNC UP”**, then signal **“ALL STOP”** at an intermediate position when the DDS is far enough from the rail to allow the mooring whips to be removed. The Deck Boss will say **“TAKE DOWN THE MOORING WHIPS”**. Once removed, the Safety Observer will inform the bridge, **“MOORING WHIPS CLEAR”**. If mooring whips were not used, this step will be skipped.
- The Deck Boss will say **“SYNC UP”** and **“LUFF IN”**, signaling the Davit Operator to bring the DriX and DDS to the rail. The Safety Observer will notify the bridge, **“AT THE RAIL”**. While at the rail, the Deck Boss will say **“RETRACT THE BOOM”**, signaling to the Painter Boom Handler to bring the boom in. The Deck Boss will then say, **“SHIFT YOUR LINES”**. The Bow Line and Stern Line Handlers will shift their lines to the inboard cleats.
- Once at the rail, the DriX team will raise the keel. This can be done remotely or manually. Once the DriX team has confirmed the keel is fully raised, they will notify the Deck Boss or Safety Observer who will inform the bridge, **“KEEL RAISED.”**
- The Deck Boss will then say **“COMING TO THE CRADLE”**, then **“LUFF OUT”**, **“SYNC UP”**, **“LUFF IN”**, and **“SYNC DOWN”** signaling the Davit Operator to bring the DDS to the cradle. Once the DDS is lowered into the cradle, the Safety Observer will notify the bridge, **“DRIX AND DDS IN THE CRADLE”**.
- Once the davit is in the stowed position, Safety Observer will inform the bridge, **“FINISHED WITH THE DAVITS,”** which the OOD will relay to the EOW.
- The DriX and DDS are made secure for sea. The davit control is stowed and the cover replaced on the control box.

5. RECORDS AND REPORTS

- Ship's Deck Log

6. REFERENCES

- NOAA Small Boat Standards and Procedures Manual
- NOAA Small Boat Standards and Procedures Manual – OMAO Supplement
- Fleet Safety Standards
- Procedure 1102-11 TJ – Small Boat Launching and Recovery

7. DEFINITIONS

Float Plan: Document required by the NOAA Small Boat Standards and Procedures Manual that includes a "Green, Amber, Red" (GAR) operational risk assessment.

Sync Up: Raising the davit wires in tandem. Hand signal is pointing 1 finger up.

Sync Down: Lowering of the davit wires in tandem. Hand signal is pointing one finger down.

Luff In: Brings davit arms inboard. Hand signal thumb up or pointing inboard.

Luff Out: Brings davit arms over the side. Hand signal is a thumb pointing down or outboard.

All Stop: Stops all davit action. Hand signal is a fist.

DriX Arm: Mechanical device to secure the DriX in the DDS by the mast.

Hoop: Mechanical device to secure the body of the DriX in the DDS.

Locking Pin: Pin used to secure the hoop closed.

DriX Deployment System (DDS): Cage used to launch and recover the DriX from the davit.

8. ABBREVIATIONS

CO	Commanding Officer
SSI	Ship Specific Instruction
GAR	Green-Amber-Red Operational Risk Management Tool
FOO	Field Operations Officer
XO	Executive Officer
OOD	Officer of the Deck
EOW	Engineer of the Watch
DDS	DriX Deployment System

9. NOTES

***EMERGENCY KILL SWITCHES are located:

- on the side of the remote control box
- at the manual controls for each davit
- on the control panel in the Hydraulic Equipment Room (01-68-1)

DOCUMENT HISTORY		
Version	Description of Change	Effective Date
1.0	Initial Document	10/XX/2019



OPS.Thomas Jefferson - NOAA Service Account
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[OMAO SCS] Submission TJ-0_2019-11-04-143149 Ops Log Error

1 message

Fred Katz <fred.katz@noaa.gov> Tue, Nov 5, 2019 at 2:45 PM
To: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, NCEI.Archive.OMAO@noaa.gov,
OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov
Cc: Steven Rutz <Steven.Rutz@noaa.gov>, Wendy Bradfield-Smith <Wendy.Bradfield-Smith@noaa.gov>

NCEI's automated process was unable to complete the data submission for TJ-0_2019-11-04-143149 because the Ops Log is not filled out and validated for the following day(s):
2019-10-30

The Ops Log is filled out and validated for the following day(s):
2019-10-14
2019-10-15
2019-10-16
2019-10-17
2019-10-18
2019-10-19
2019-10-20
2019-10-21
2019-10-22
2019-10-23
2019-10-24
2019-10-25
2019-10-26
2019-10-27
2019-10-28
2019-10-29

Please make sure the Ops Log has been filled out and validated for all of the days. NCEI's automated process will check the submission again in 24 hours.



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-04-143149 received

1 message

Fred Katz <fred.katz@noaa.gov>

Fri, Nov 22, 2019 at 2:48 PM

To: NCEI.Archive.OMAO@noaa.gov

Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov

The OMAO SCS SIP TJ-0_2019-11-04-143149 was received and has been validated. You can find the SIP at /nodc/data/OMAO-SCS/SIP/TJ-0_2019-11-04-143149



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] Submission TJ-0_2019-11-22-182002 Ops Log Error

1 message

Fred Katz <fred.katz@noaa.gov> Sat, Nov 23, 2019 at 2:38 PM
To: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni <Cecile.Benigni@noaa.gov>, NCEI.Archive.OMAO@noaa.gov, OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov
Cc: Steven Rutz <Steven.Rutz@noaa.gov>, Wendy Bradfield-Smith <Wendy.Bradfield-Smith@noaa.gov>

NCEI's automated process was unable to complete the data submission for TJ-0_2019-11-22-182002 because the Ops Log is not filled out and validated for the following day(s):

2019-11-20
2019-11-21
2019-11-22

The Ops Log is filled out and validated for the following day(s):

2019-11-18
2019-11-19

Please make sure the Ops Log has been filled out and validated for all of the days. NCEI's automated process will check the submission again in 24 hours.



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-22-180457 received

1 message

Fred Katz <fred.katz@noaa.gov>

Sat, Nov 23, 2019 at 2:36 PM

To: NCEI.Archive.OMAO@noaa.gov

Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov

The OMAO SCS SIP TJ-0_2019-11-22-180457 was received and has been validated. You can find the SIP at /nodc/data/OMAO-SCS/SIP/TJ-0_2019-11-22-180457



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-04-143149 published as NCEI Accession 0207401

1 message

Fred Katz <fred.katz@noaa.gov> Tue, Nov 26, 2019 at 2:53 AM
To: OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov
Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
NCEI.Archive.OMAO@noaa.gov

NCEI has archived SCS package TJ-0_2019-11-04-143149 as:
Underway meteorological, navigational, physical and time series data collected
aboard NOAA Ship Thomas Jefferson in the North Atlantic Ocean from 2019-10-14
to 2019-10-31 (NCEI Accession 0207401)

Ship Daily Activity Logging (SDAL) Information:
SchedProjectID: 5986
Cruise Name: Data Submittal Cruise
Leg Number: Leg 1

Data were archived for the following dates:

2019-10-14
2019-10-15
2019-10-16
2019-10-17
2019-10-18
2019-10-19
2019-10-20
2019-10-21
2019-10-22
2019-10-23
2019-10-24
2019-10-25
2019-10-26
2019-10-27
2019-10-28
2019-10-29
2019-10-30

You can find your archival data set and associated metadata at

<https://accession.nodc.noaa.gov/0207401>.



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-22-180457 ingest errors occurred

2 messages

Fred Katz <fred.katz@noaa.gov> Tue, Nov 26, 2019 at 2:53 AM
To: NCEI.Archive.OMAO@noaa.gov, Chiefet.thomas.jefferson@noaa.gov,
OPS.Thomas.Jefferson@noaa.gov
Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>

Problems were found during ingest processing of the TJ-0_2019-11-22-180457 submission package:

TJ-0_2019-11-22-180457: Submitter "Witmer", "Justin" not found in OMAO Submitter Table

Fred Katz - NOAA Affiliate <fred.katz@noaa.gov> Tue, Nov 26, 2019 at 11:15 AM
To: _NESDIS NCEI Archive OMAO <NCEI.Archive.OMAO@noaa.gov>, Chief ET
Thomas Jefferson <Chiefet.thomas.jefferson@noaa.gov>, "OPS. Thomas Jefferson -
NOAA Service Account" <OPS.Thomas.Jefferson@noaa.gov>
Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>

Justin Witmer has been added to the Submitter Table and ingest of package TJ-0_2019-11-22-180457 can proceed.

Fred
Fred Katz, MLS, MA History, MA Mathematics
Scientific Data Manager for Environmental Stewardship
(ESSIC Assignment)
NCEI Maryland
1315 East-West Hwy,
SSMC-3, 4616
Silver Spring, MD 20910
(301) 713-4925
fred.katz@noaa.gov

[Quoted text hidden]



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-22-182002 received

1 message

Fred Katz <fred.katz@noaa.gov>

Wed, Nov 27, 2019 at 2:34 PM

To: NCEI.Archive.OMAO@noaa.gov

Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov

The OMAO SCS SIP TJ-0_2019-11-22-182002 was received and has been validated. You can find the SIP at /nodc/data/OMAO-SCS/SIP/TJ-0_2019-11-22-182002



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-22-180457 published as NCEI Accession 0207401

1 message

Fred Katz <fred.katz@noaa.gov> Sat, Nov 30, 2019 at 3:10 AM
To: OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov
Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
NCEI.Archive.OMAO@noaa.gov

NCEI has archived SCS package TJ-0_2019-11-22-180457 as:
Underway meteorological, navigational, physical and time series data collected
aboard NOAA Ship Thomas Jefferson in the North Atlantic Ocean from 2019-10-14
to 2019-11-15 (NCEI Accession 0207401)

Ship Daily Activity Logging (SDAL) Information:
SchedProjectID: 5986
Cruise Name: Data Submittal Cruise
Leg Number: Leg 1

Data were archived for the following dates:
2019-11-09
2019-11-10
2019-11-11
2019-11-12
2019-11-13
2019-11-14
2019-11-15

You can find your archival data set and associated metadata at
<https://accession.nodc.noaa.gov/0207401>.



OPS.Thomas Jefferson - NOAA Service Account
<ops.thomas.jefferson@noaa.gov>

[OMAO SCS] TJ-0_2019-11-22-182002 published as NCEI Accession 0207401

1 message

Fred Katz <fred.katz@noaa.gov>

Wed, Dec 4, 2019 at 3:26 AM

To: OPS.Thomas.Jefferson@noaa.gov, Chiefet.thomas.jefferson@noaa.gov

Cc: Solomon Tadele <solomon.tadele@noaa.gov>, Cecile Benigni
<Cecile.Benigni@noaa.gov>, Steven Rutz <Steven.Rutz@noaa.gov>,
NCEI.Archive.OMAO@noaa.gov

NCEI has archived SCS package TJ-0_2019-11-22-182002 as:

Underway meteorological, navigational, physical and time series data collected
aboard NOAA Ship Thomas Jefferson in the North Atlantic Ocean from 2019-10-14
to 2019-11-22 (NCEI Accession 0207401)

Ship Daily Activity Logging (SDAL) Information:

SchedProjectID: 5986

Cruise Name: Data Submittal Cruise

Leg Number: Leg 1

Data were archived for the following dates:

2019-11-18

2019-11-19

2019-11-20

2019-11-21

2019-11-22

You can find your archival data set and associated metadata at
<https://accession.nodc.noaa.gov/0207401>.



Calandria DeCastro - NOAA Federal <calandria.m.decastro@noaa.gov>

Re: Notice of MSAT Training

Jay Nunenkamp - NOAA Federal <jay.nunenkamp@noaa.gov>

Mon, Mar 30, 2020 at 6:27 AM

To: "OPS.Thomas Jefferson - NOAA Service Account" <ops.thomas.jefferson@noaa.gov>

Received, thank you.

Sincerely,

Jay Nunenkamp (he/his)
Environmental Compliance Coordinator
Office of Coast Survey
National Oceanic and Atmospheric Administration
Please note that my current work hours are **6 AM - 2:30 PM EDT**

On Fri, Mar 27, 2020 at 8:28 PM OPS.Thomas Jefferson - NOAA Service Account <ops.thomas.jefferson@noaa.gov> wrote:

Good evening,

Apologies for the memo slipping off our radar- attached is the list of personnel aboard NOAA Ship *Thomas Jefferson* who completed Marine Species Awareness Training prior to the start of our 2019 field season.

V/r,

--

LT Calandria DeCastro, NOAA
Operations Officer, NOAA Ship *Thomas Jefferson*
Ship Land Line: 757-441-6322
Ship Cell: 757-647-0187
Ship Iridium: 808-434-2706



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

March 25, 2020

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

FROM: LT Calandria DeCastro, NOAA *Calandria DeCastro* ^{LT NOAA}
Operations Officer, NOAA Ship *Thomas Jefferson*

SUBJECT: Recipients of Marine Species Awareness Training

The following personnel of NOAA Ship *Thomas Jefferson* completed the required Marine Species Awareness Training (MSAT) on September 6, 2019:

- CDR Briana Hillstrom
- LCDR Meghan McGovern
- LT Charles Wisotzkey
- LT Calandria DeCastro
- ENS Julia Waldsmith
- ENS Patrick Faha
- 1AE Orwin Cummings
- 2AE Stephen Williams
- 3AE Otis Tate
- JUE Sharon Gilliam
- EU Michael Wilson
- HST Kevin Brown
- HAST Erin Cziraki
- HAST Chloe Arboleda
- CB Bernard Poser
- SS James Brzostek
- AB Thomas Bascom

APPROVAL PAGE

H13327

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
- Data Acquisition and Processing Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Processed survey data and records
- Geospatial PDF of survey products
- Collection of backscatter mosaics

The survey evaluation and verification have been conducted according to current OCS specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

Commander Meghan McGovern, NOAA
Chief, Atlantic Hydrographic Branch