

H13307

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H13307

LOCALITY

State(s): South Carolina

General Locality: Western Blake Plateau, 80 NM East of Charleston, SC

Sub-locality: Blake Plateau, 65NM Offshore of Charleston

2019

CHIEF OF PARTY
Julia Wallace, Physical Scientist

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H13307

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): **South Carolina**

General Locality: **Western Blake Plateau, 80 NM East of Charleston, SC**

Sub-Locality: **Blake Plateau, 65NM Offshore of Charleston**

Scale: **200000**

Dates of Survey: **08/13/2019 to 08/30/2019**

Instructions Dated: **08/02/2019**

Project Number: **S-G959-NF-19**

Field Unit: **NOAA Ship Nancy Foster (R352)**

Chief of Party: **Julia Wallace, Physical Scientist**

Soundings by: **Kongsberg Maritime EM 2040 (MBES)**

Imagery by: **Kongsberg Maritime EM 2040 (MBES Backscatter)**

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 17N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

DESCRIPTIVE REPORT SUMMARY

A. Area Surveyed

H13307 covers approximately 410 square nautical miles and is located approximately 65NM east of the Charleston Harbor Entrance Channel. This hydrographic survey was acquired in accordance with the requirements defined in the Project Instructions S-G959-NF-19.

Survey coverage was assigned in the Project Instructions (PI) as Complete Coverage. Survey coverage was in accordance with the requirements listed in the PI and in the Hydrographic Surveys Specifications and Deliverables (HSSD) 2019.

The northwest corner of the assigned polygon was not covered due to a line-planning error. At the time of initial acquisition, this coverage holiday was not remedied. Due to the size of the sheet, it was not feasible to return to this corner to collect data. This coverage gap is approx. 0.01 square nautical miles in area (Figure 2). Additionally, the NE corner was not completed due to time constraints and limited survey days due to tropical weather, this coverage gap is approx. 5.2 square nautical miles in area (Figure 3). Finally, a significant coverage holiday exists in the SW region of the survey area. This region was also not completed due to time constraints and limited survey days caused by tropical weather, this coverage holiday is approx. 6.6 square nautical miles in area (Figure 4). The hydrographer recommends that the field unit returns to this project area in the near future to fill in the NE corner and SW holiday.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
32° 54' 50.45" N 78° 59' 2.34" W	32° 42' 12.23" N 78° 0' 53.37" W

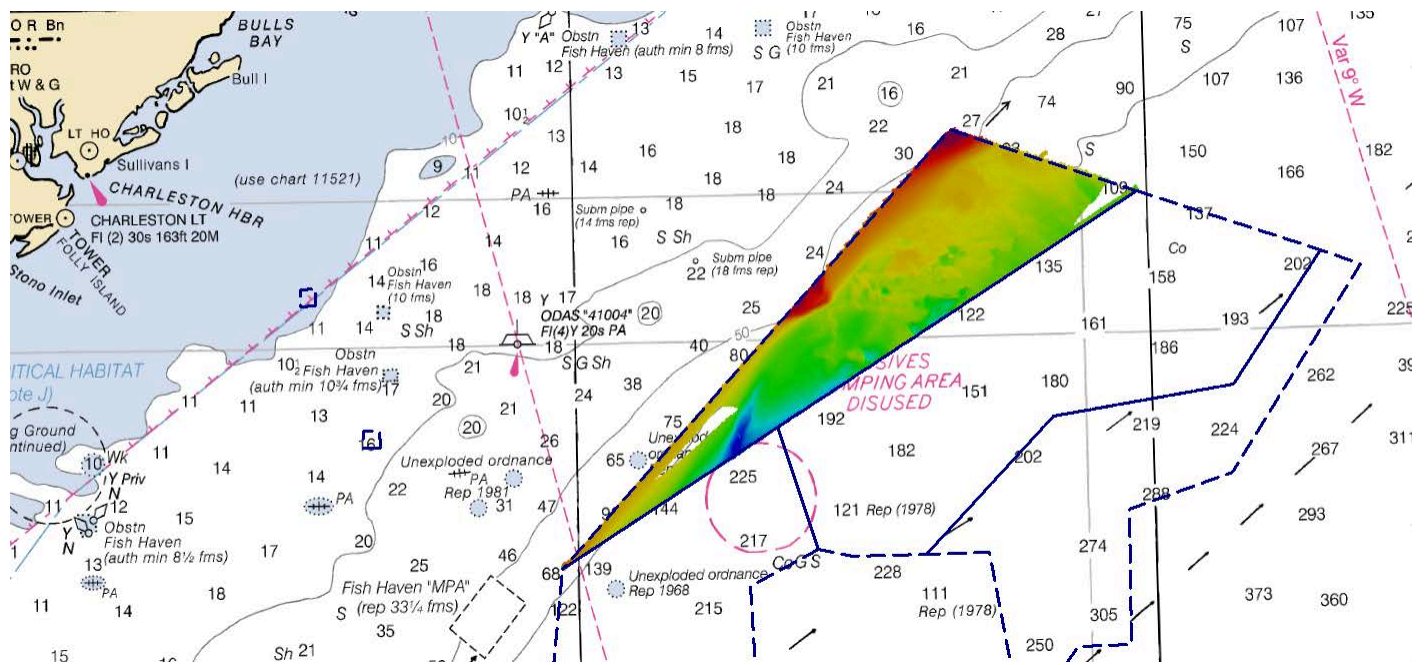


Figure 1: Figure 1. Survey Extents of H13307.

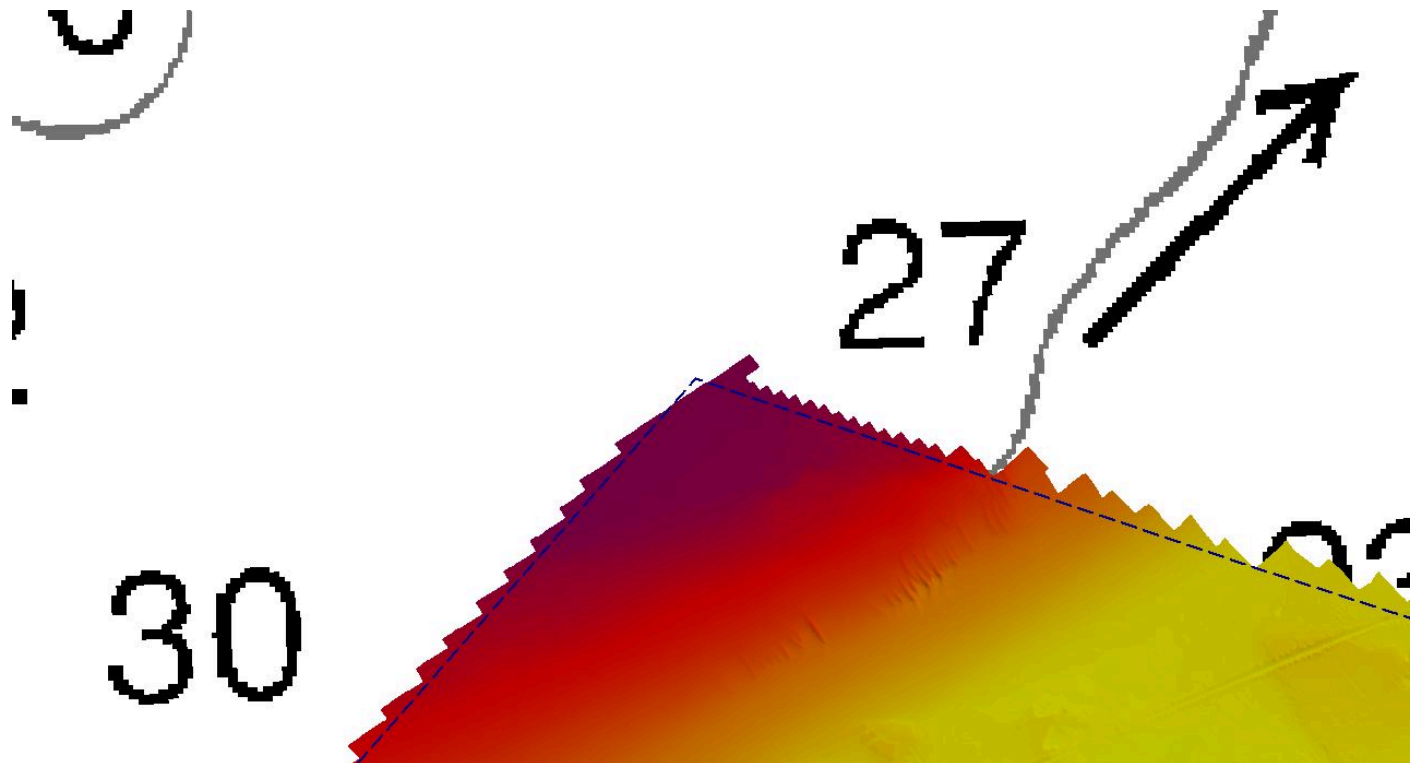


Figure 2: Figure 2. Coverage gap in the NW corner of H13307 between acquired data and assigned sheet limits per the PI.

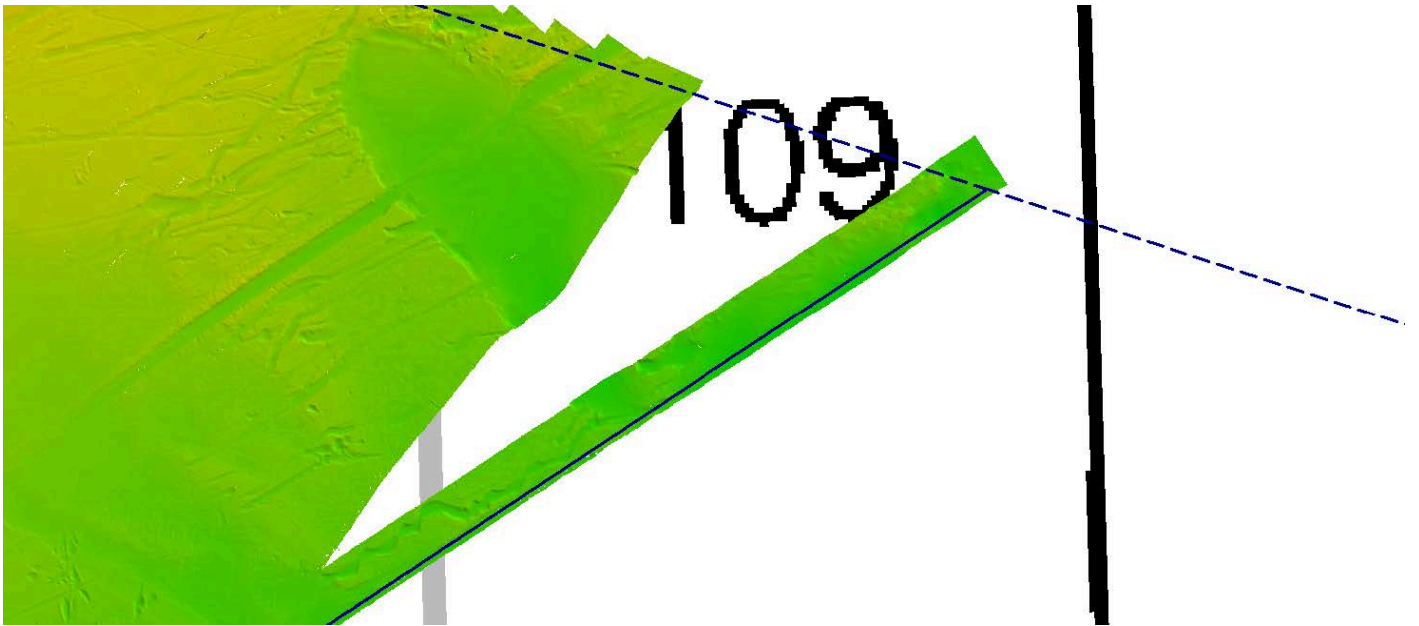


Figure 3: Figure 3. Coverage gap in the NE corner of H13307 between acquired data and assigned sheet limits per the PI.

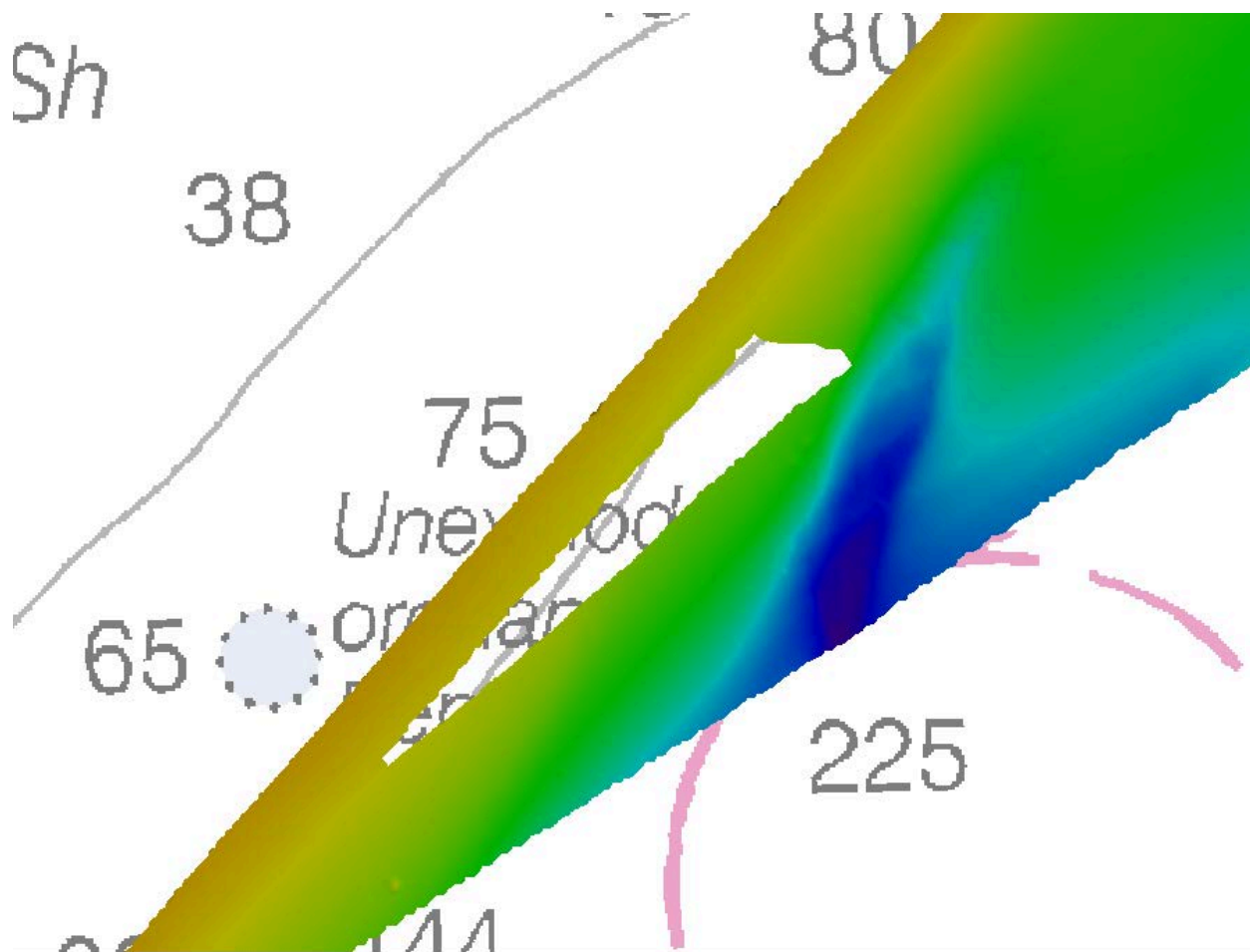


Figure 4: Figure 4. Coverage holiday in the SW region of H13307.

B. Survey Purpose

This project was conducted in collaboration with NOAA's Office of Coast Survey (OCS) and Office of Ocean Exploration and Research to map several large priority areas offshore of South Carolina on the Blake Plateau. The primary objective of this seafloor mapping project was to provide multibeam bathymetry, acoustic backscatter data, and water column data to provide contemporary hydrographic data to update nautical charting products. This project also addressed NOAA's requirements to meet the needs of continuous multibeam coverage within the U.S. Exclusive Economic Zone.

C. Intended Use of Survey

The entire survey is adequate to supersede previous data.

This survey is adequate to supersede charted soundings within the common coverage. This survey does not provide data within a 6.6 square nautical mile holiday.

Survey Statistics:

Due to the ship's schedule, acquisition time was limited. Originally, 18 acquisition days were planned for this project. Due to mechanical problems and tropical weather, only 11 days were spent on acquisition.

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

R352 – NOAAS	<i>Nancy Foster</i>	<i>Total</i>
LNM	MBES Mainscheme	1150
	MBES Crosslines	0
SNM	Total Coverage	413

Figure 5:

D. Data Acquisition and Processing

Please reference Data Acquisition and Processing Report S-G959-NF-19_DAPR for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Multibeam echosounder (MBES) bathymetry data, multibeam acoustic backscatter (MBAB) data, and multibeam watercolumn data were acquired per the project instructions. Both the MBES and MBAB data were processed and products were made using these data using methods described in the DAPR report. The watercolumn data were not processed and will be submitted in a raw format with this survey.

E. Uncertainty

The following survey specific parameters were used for this survey:

Survey Specific Tide TPU Values:

Measured - No Measure

Zoning - 0.100m

Survey Specific Sound Speed TPU Values:

SV Measured - 4.0 m/s

SV Surface - 1.0 m/s

For surface H13307_MB_VR_MLLW_Final, more than 99.5% of all nodes were within the acceptable IHO Order 2 uncertainty standards (Figure 2). Additionally, more than 99.5% of all nodes passed data density standards for complete coverage surveys per section 5.2.2.2 of the 2019 HSSD. (Figure 3).

Crosslines -

Due to time constraints, crossline acquisition was not achieved for this survey. With the approval of HSD OPS, two previous surveys from the NANCY FOSTER will be used to complete crossline comparisons. These two projects were conducted by the NANCY FOSTER in 2014 and 2015. Both were submitted to the Atlantic Hydrographic Branch as External Source Data (ESD) surveys and were evaluated for chart application. The surveys are NF-1408-MPA/W00379 and NF-1506-EFH-SE/W00408. W00379 contains 21.4 NM of overlap with H13307. W00408 contains 22.6 NM of overlap with H13307. See DR Appendix II for more information regarding this substitution.

Crosslines from previous surveys totaled 3.8% of mainscheme acquisition. (Figure 4)

In order to evaluate crossline agreement, an 8m surface from H13307 was compared against 8m surfaces from W00379 and W00408. This comparison was performed using the Compare Grids tool in PydroXL. When comparing H13307 and W00379, the mean difference between the two surfaces was found to be 1.04m, with a standard deviation of 0.28 (Figure 5). It is important to note that W00379 data have not had a vertical datum applied. When comparing H13307 and W00408, the mean difference between the two surfaces was found to be -0.04m, with a standard deviation of 0.46 (Figure 6).

Factors Affecting Soundings -

Due to her design as a flat-bottomed vessel NANCY FOSTER, elevated wave heights and swell cause the ship to rock more significantly than other vessels with V-shaped hulls. As such, a sea state with waves of 5ft or greater has been known to impact the multibeam data on NANCY FOSTER. Multibeam "blow outs" are present in several portions of H13307. These blowouts were primarily caused by an elevated sea state during several working days of the project. The presence of the blowouts across the multibeam surface appear like stripes running parallel to the track line (Figure 7). Although present throughout much of the survey, the magnitude of the blowouts does not exceed allowable TVU for all applicable depths and does not cause any spikes in the multibeam surface significant enough to be considered fliers. Additionally, in parts of the survey, small, density-related holidays are present due again primarily to an elevated sea state.

Holidays -

Three holidays exist in the final variable resolution grid. Two of these holidays are related to "blow outs" in the EM710 system related to an elevated sea state during acquisition. Due to the size of the sheet and the time constraints of this survey, it was not feasible to return to these areas and fill in the holidays. The holidays are:

32 43 28.1444N, 078 24 09.3797W

32 44 38.4496N, 078 20 23.3326W

(Figure 8).

The third holiday is located in the SW region of the survey area and is addressed above (See section A).

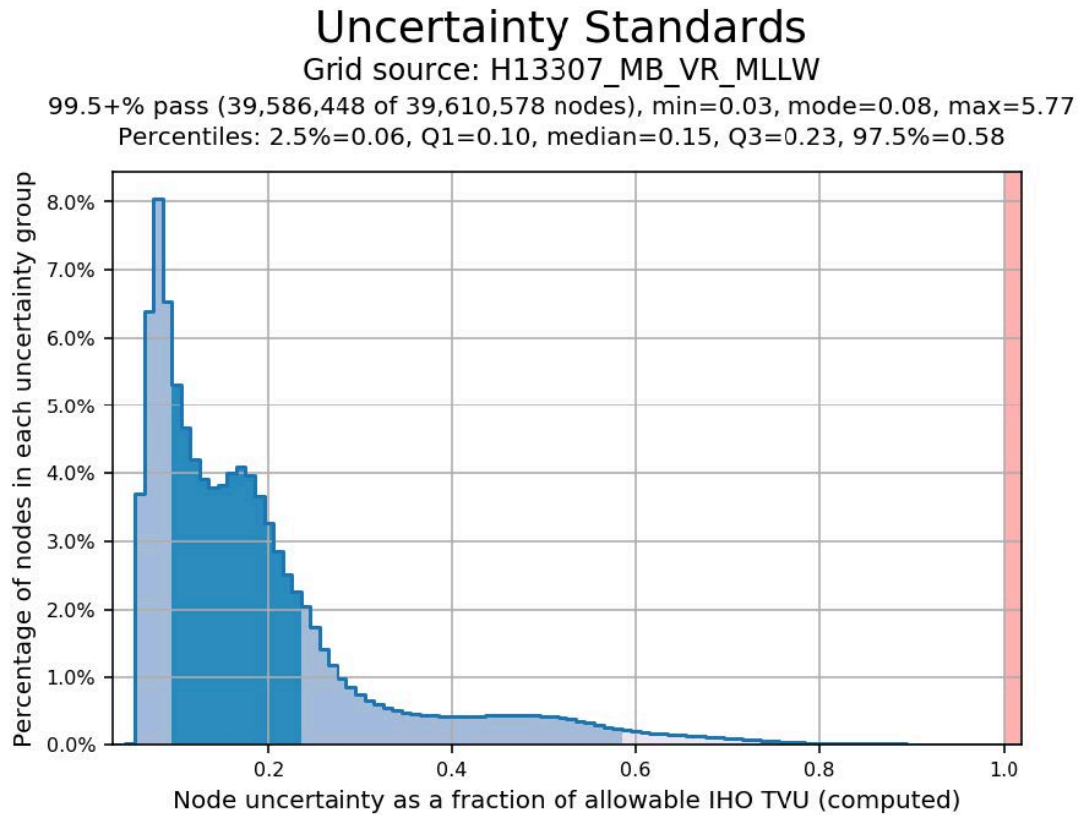


Figure 6: Figure 2. H13307 IHO Order 1 Uncertainty Standards from QC Tools v3.0.13

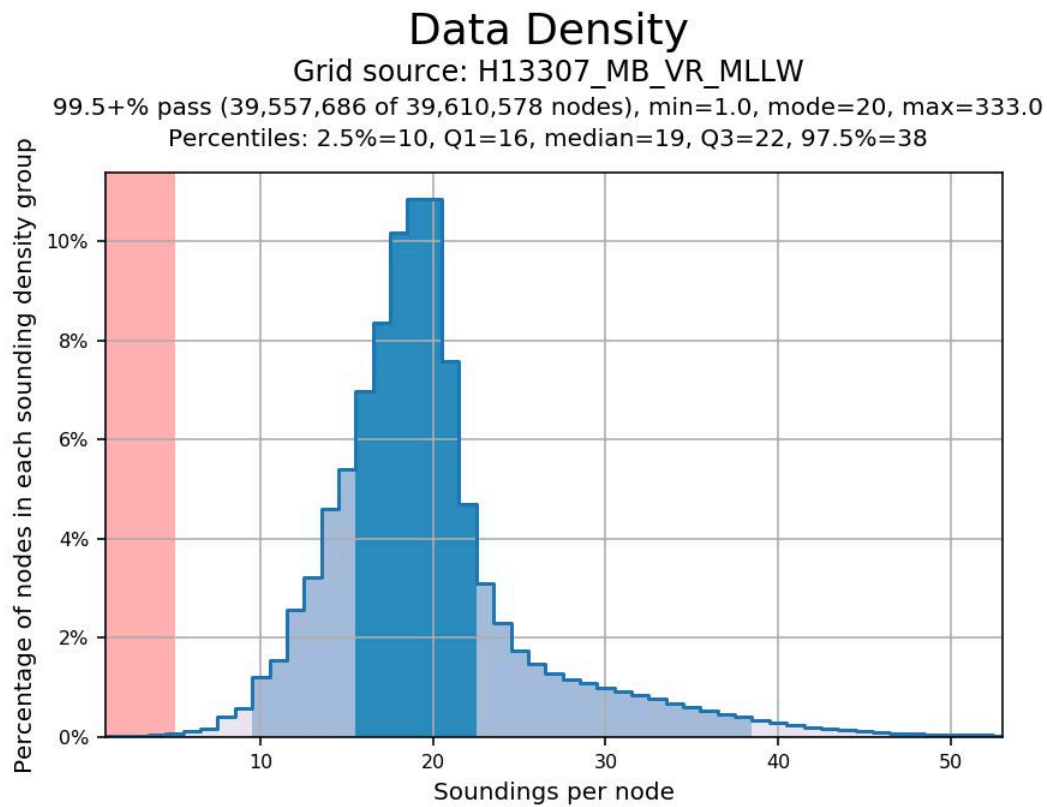


Figure 7: Figure 3. H13307 Complete Coverage Density Statistics from QC Tools v.3.0.13

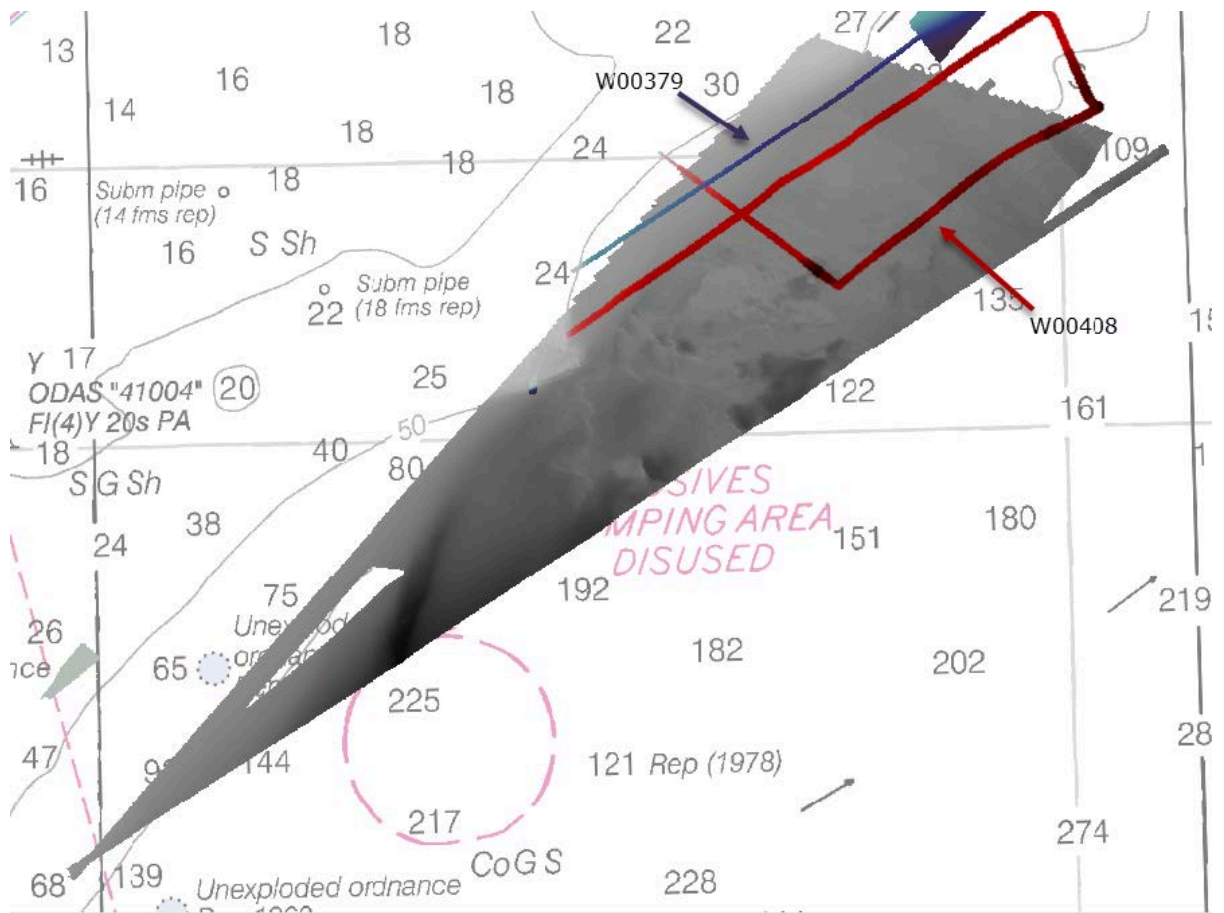


Figure 8: Figure 4. H11307 MBES mainscheme data, shown in grey, overlaid with surveys W00379 (blue) and W00408 (red).

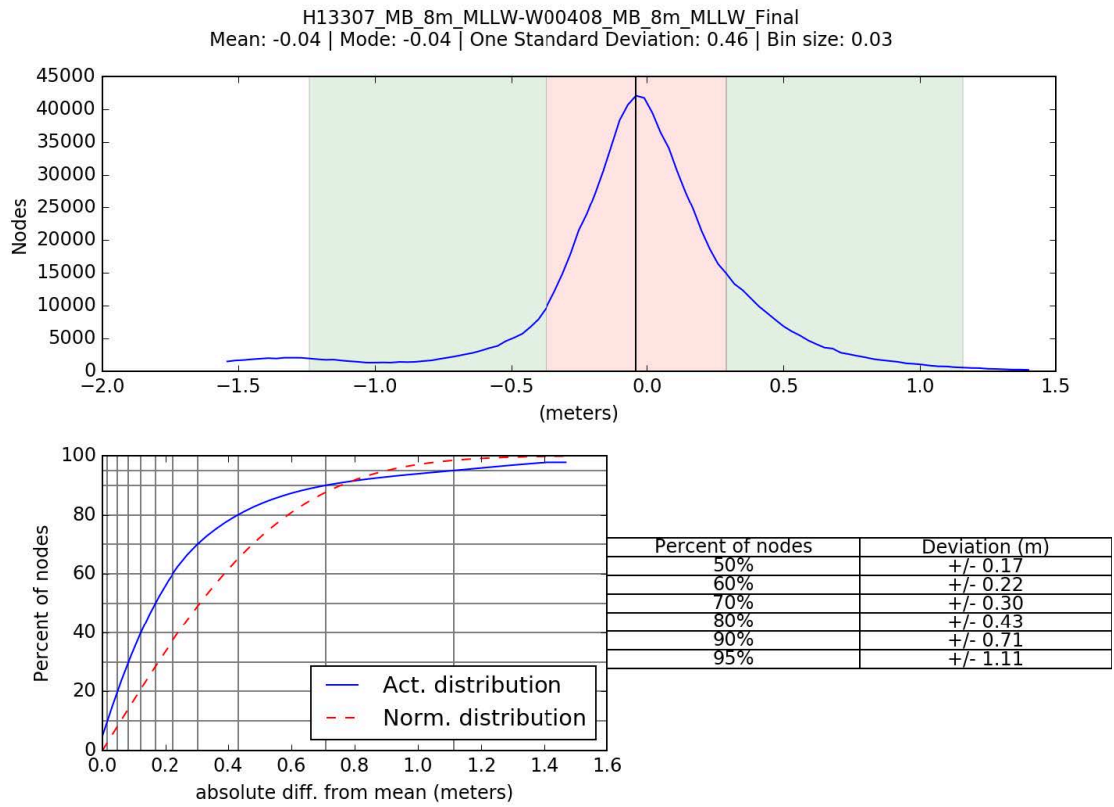


Figure 9: Figure 5. Crossline difference statistics between H13307 and W00379.

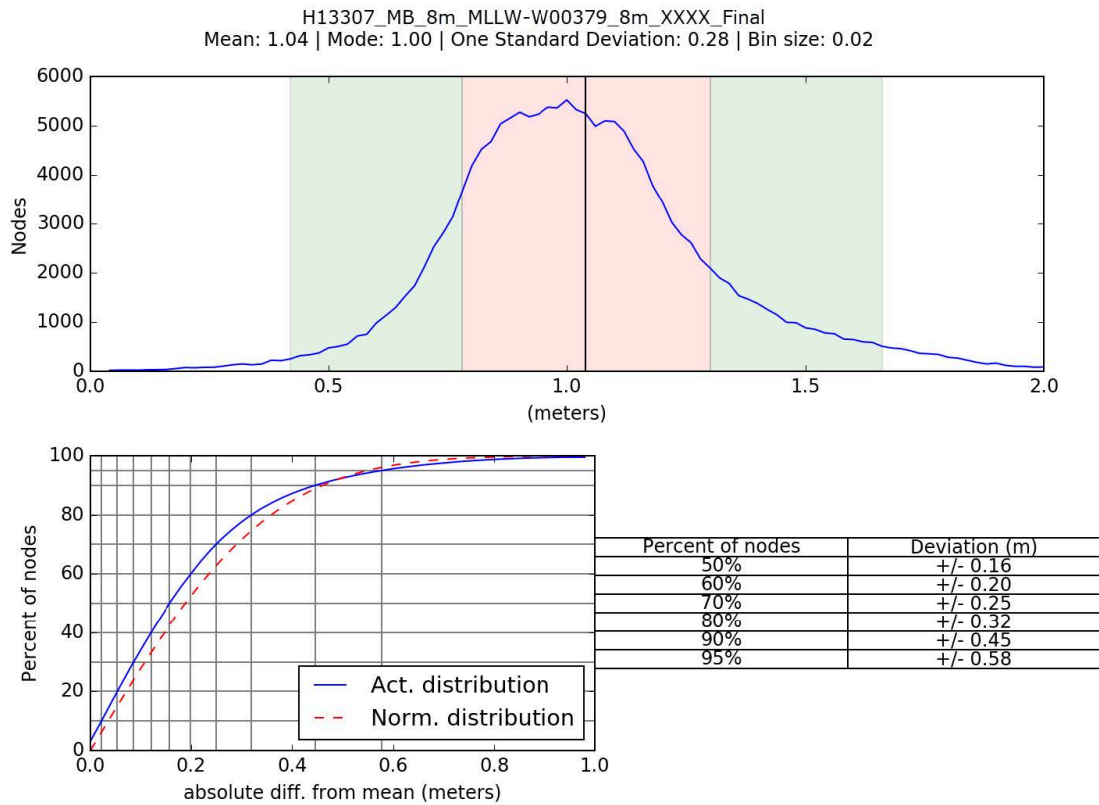


Figure 10: Figure 6. Crossline difference statistics between H13307 and W00408.

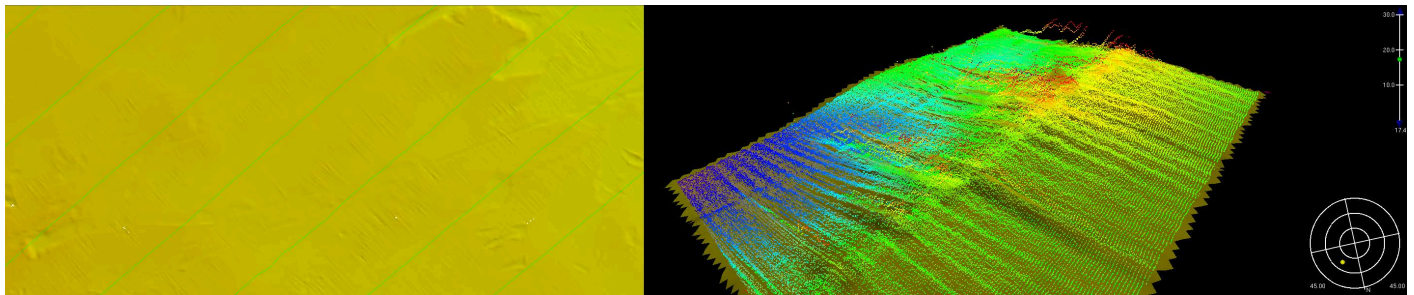


Figure 11: Figure 7. Blowouts present in H13307 data caused by an elevated sea state.

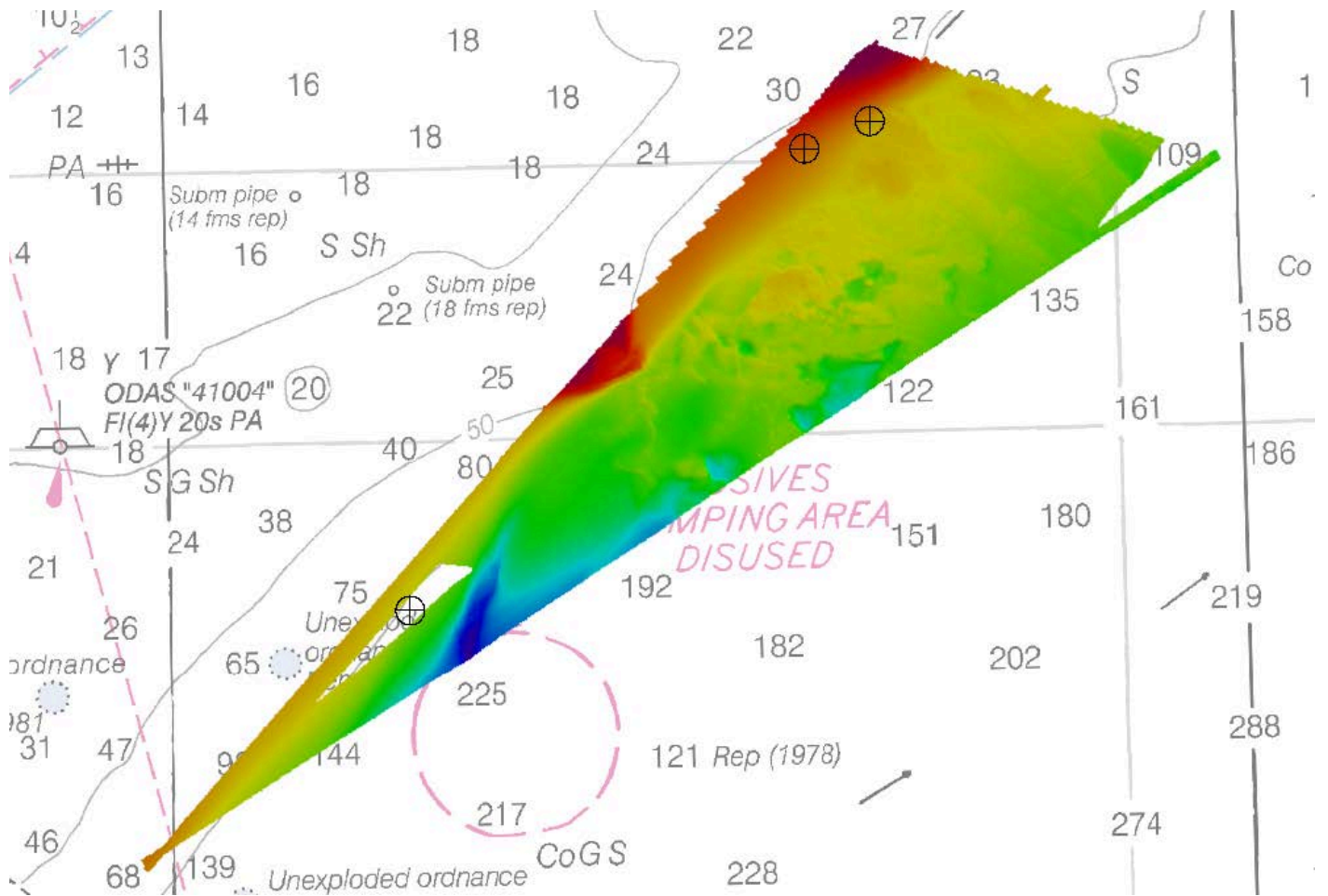


Figure 12: Figure 8. Locations of the three holidays in H13307.

Figure numbers are incorrect and should begin this section with Figure 6 instead of Figure 2 for H13307 IHO Order 1 Uncertainty Standards from QC Tools v3.0.13, and increase in number for subsequent figures through Figure 13.

F. Results and Recommendations

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US2EC02M	1:1200000	26	03/28/2019	08/19/2019	NO

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H13307_MV_VR_MLLW	CARIS Raster Surface (CUBE)	Variable Resolution m	43.7 m - 447.8 m	NOAA_VR	Complete MBES
H13307_MB_VR_MLLW_Final	CARIS Raster Surface (CUBE)	Variable Resolution m	29.4 m - 32.5 m	NOAA_VR	Complete MBES
H13307_MBAB_6m_R352_70kHz_1of1	MB Backscatter Mosaic	6 m	N/A	N/A	Multibeam Acoustic Backscatter

A chart comparison was conducted between survey H13307 and previously charted ENC soundings. It was noted that no records of sonar mapping having been conducted in this region could be located. Charted soundings and surveyed soundings generally agree within 10m.

There is a coverage holiday in the SW corner of the survey. There are no charted soundings within the holiday however, the 182.8m contour does run through it.

Wreck PA -

A charted wreck PA is located within the sheet limits at 32 44 02.8140N, 078 12 56.6597W. Complete multibeam coverage was achieved with a 3500m radius over the charted wreck. No evidence of the charted wreck was detected in multibeam or backscatter data. The wreck is included in the Final Feature File and is recommended by the hydrographer to be removed from the chart (Figure 9).

The surfaces delivered meet IHO Order 2 specifications for total vertical uncertainty and comply with the density requirements in the 2019 HSSD (Section E).



Figure 13: Figure 9. Charted Wreck PA location

Incorrect figure number. Figure number should be Figure 14 instead of Figure 9.

G. Vertical and Horizontal Control

The vertical datum for this project is Mean Lower Low Water. The vertical control method used was VDatum.

Ellipsoid to Chart Datum Separation File:
S-G959-NF-19_F00783_NAD83_Vdatum_MLLW

All soundings submitted are reduced to MLLW using VDatum techniques detailed in the DAPR.

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 17.

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 17.

The horizontal datum for this project is World Geodetic System of 1984 (WGS84). The projection used for the project is Universal Transverse Mercator (UTM) Zone 17 North. The submitted surface is in North American Datum of 1983 (NAD83).

H. Additional Results

There are no additional results for this survey.

I. Approval

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 Survey Summary 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, Standing and 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 Survey Summary Report.

Approver Name	Title	Date	Signature
Julia Wallace	Physical Scientist, Chief of Party	09/24/2019	Julia Wallace <small>Digitally signed by Julia Wallace Date: 2019.09.24 13:51:52 -04'00'</small>