

F00866

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

DESCRIPTIVE REPORT

Type of Survey: Field Examination

Registry Number: F00866

LOCALITY

State(s): North Carolina

General Locality: Cape Lookout, Onslow Bay, NC

Sub-locality: Lookout Bight

2022

CHIEF OF PARTY
Michael Gonsalves, CDR/NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00866

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

State(s): **North Carolina**

General Locality: **Cape Lookout, Onslow Bay, NC**

Sub-Locality: **Lookout Bight**

Scale: **20000**

Dates of Survey: **07/19/2022 to 09/22/2022**

Instructions Dated: **N/A**

Project Number: **OPR-F364-FH-22**

Field Unit: **NOAA Ship *Ferdinand R. Hassler***

Chief of Party: **Michael Gonsalves, CDR/NOAA**

Soundings by: **R2Sonic 2024 (MBES)**

Imagery by: **N/A**

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.

DESCRIPTIVE REPORT SUMMARY

A. Area Surveyed

Survey F00866 is located within Lookout Bight in Onslow Bay, North Carolina and encompasses about 0.5 square nautical miles.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
34° 38' 34.37" N 76° 33' 20.41" W	34° 37' 3.11" N 76° 32' 22.76" W

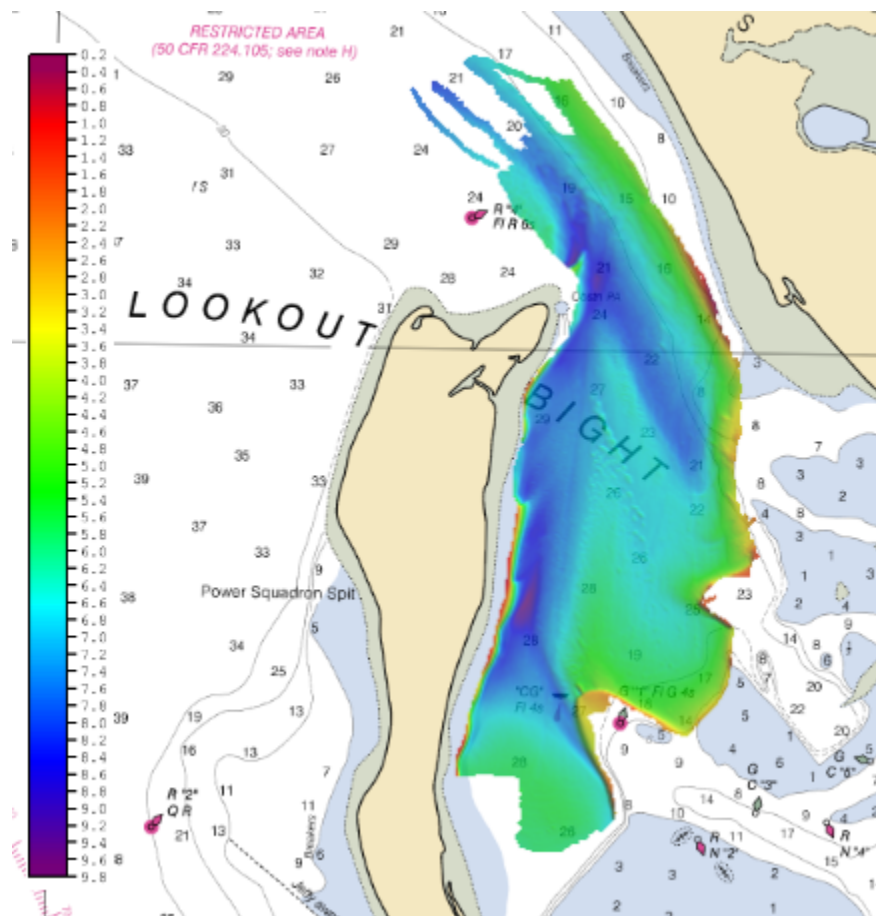


Figure 1: Geographic extents of survey F00866 within Lookout Bight (overlaid on NOAA Chart 11545_2).

B. Survey Purpose

In conducting a reconnaissance survey for the use of NOAA Ship Ferdinand R. Hassler anchoring in conjunction with acquisition on OPR-F364-FH-22, the surveyed depths and contours significantly disagreed with the most recent edition chart. Correspondence was initiated leading to the assignment of F00866 as a field examination to support updated charted information in this area (see Project Correspondence). The location is suitable for anchoring and shelter of small and intermediate-sized vessels, and regularly supports recreational traffic.

C. Intended Use of Survey

The entire survey is adequate to supersede previous data.

D. Data Acquisition and Processing

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.

Survey Launch 2702, equipped with an R2Sonic, was used for all data acquisition.



Figure 2: Launch 2702 with R2sonic sonar

E. Uncertainty

Total Propagated Uncertainty (TPU) values for survey F00866 were derived from a combination of fixed values for equipment and vessel characteristics, as well as from field assigned values for sound speed uncertainties. Additionally, real-time and post-processed uncertainty sources associated with position were applied using SBET and RMS files generated using POSPac MMS software. The bathymetric surface is compliant with 2022 HSSD uncertainty standards; over 99.5% of all nodes pass.

Uncertainty Standards - NOAA HSSD

Grid source: F00866_MB_1m_MLLW

100% pass (1,507,522 of 1,507,522 nodes), min=0.38, mode=0.39, max=0.50

Percentiles: 2.5%=0.38, Q1=0.39, median=0.39, Q3=0.39, 97.5%=0.40

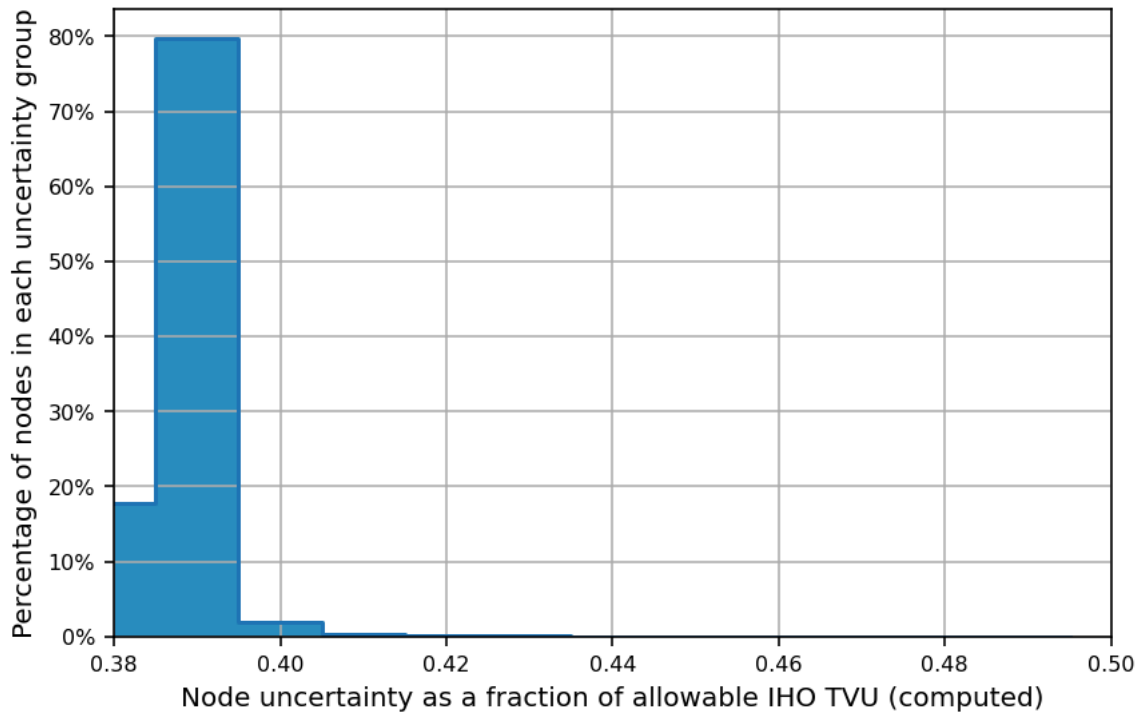


Figure 3: Pydro-derived plot showing Total Vertical Uncertainty (TVU) compliance of F00866's finalized 1-meter resolution surface.

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
US5MRHCD	1:20000	2	05/05/2022	08/22/2022

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00866_MB_1m_MLLW	CARIS Raster Surface (CUBE)		0.34 m - 9.69 m	NOAA_1m	Complete MBES
F00866_MB_1m_MLLW_Final	CARIS Raster Surface (CUBE)		0.34 m - 9.69 m	NOAA_1m	Complete MBES

Submitted surfaces were generated using the NOAA recommended parameters for depth-based (ranges) CARIS single-resolution bathymetric grids as specified in the 2022 HSSD.

A DTON Report was submitted for this data on 21 November 2022. Given the complex changes from the chart, the DTON report was submitted with linear features (e.g. contours) to better delineate the areas of change and concern (see Figure 4).

After multiple rounds of cleaning using NOAA QC Tools' Flier Finder, available in NOAA's Pydro Explorer suite, 112 fliers remained (all "noisy edges"). Each of these potential fliers were examined in CARIS Subset editor and determined to be accurate representations of the seafloor, along distinct features or rapid changes in bottom depth (see Figure 5).

Pydro QC Tools Grid QA was used to analyze F00866 multibeam echosounder (MBES) data density. The submitted F00866 1-meter resolution surface meets HSSD density requirements as shown in the histogram below (see Figure 6).

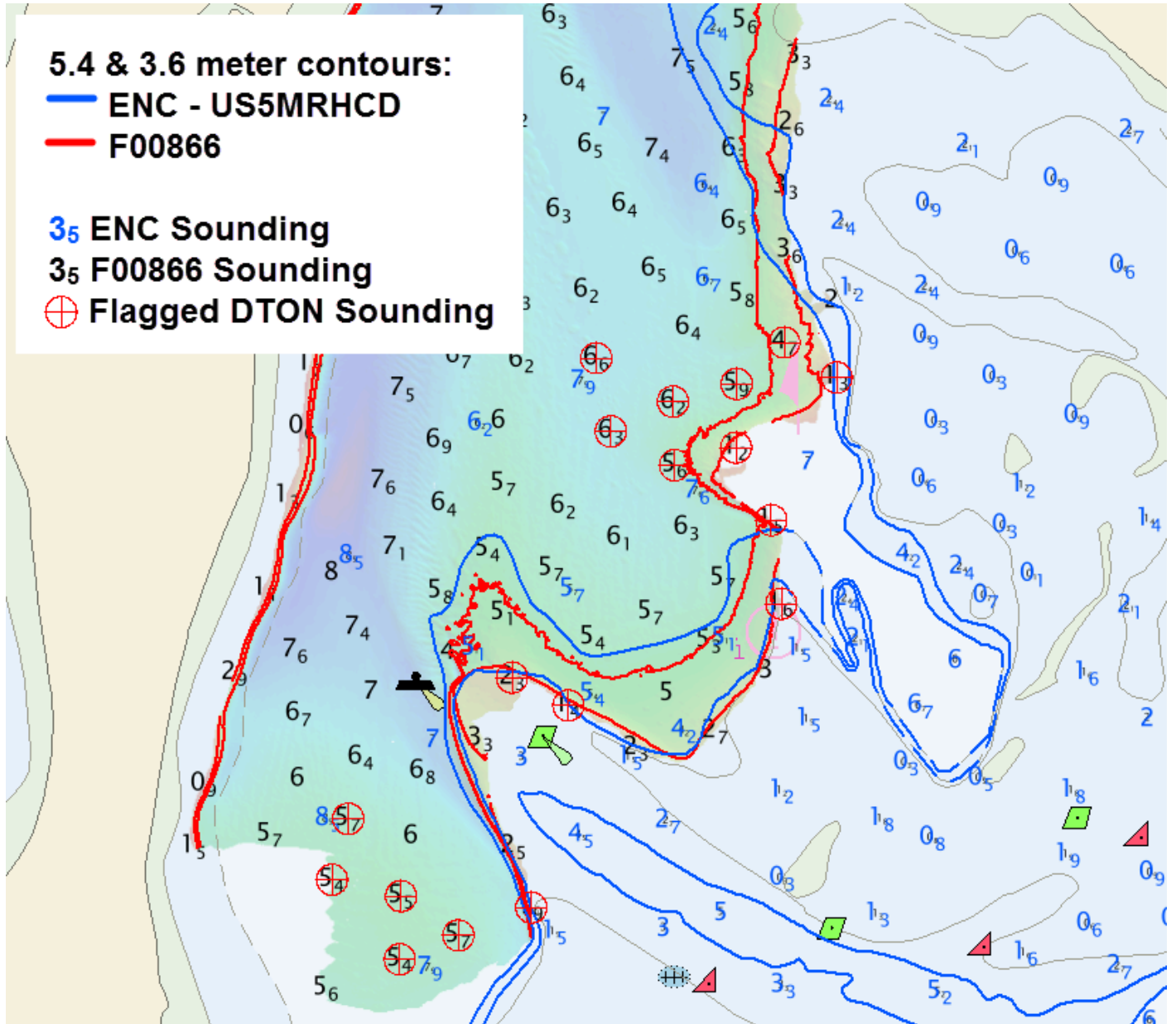


Figure 4: Chart comparison highlighting submitted DTONs: updating of 5.4 and 3.6-meter contours (highlighted in red), and addition of shoal soundings (marked with red crosses).

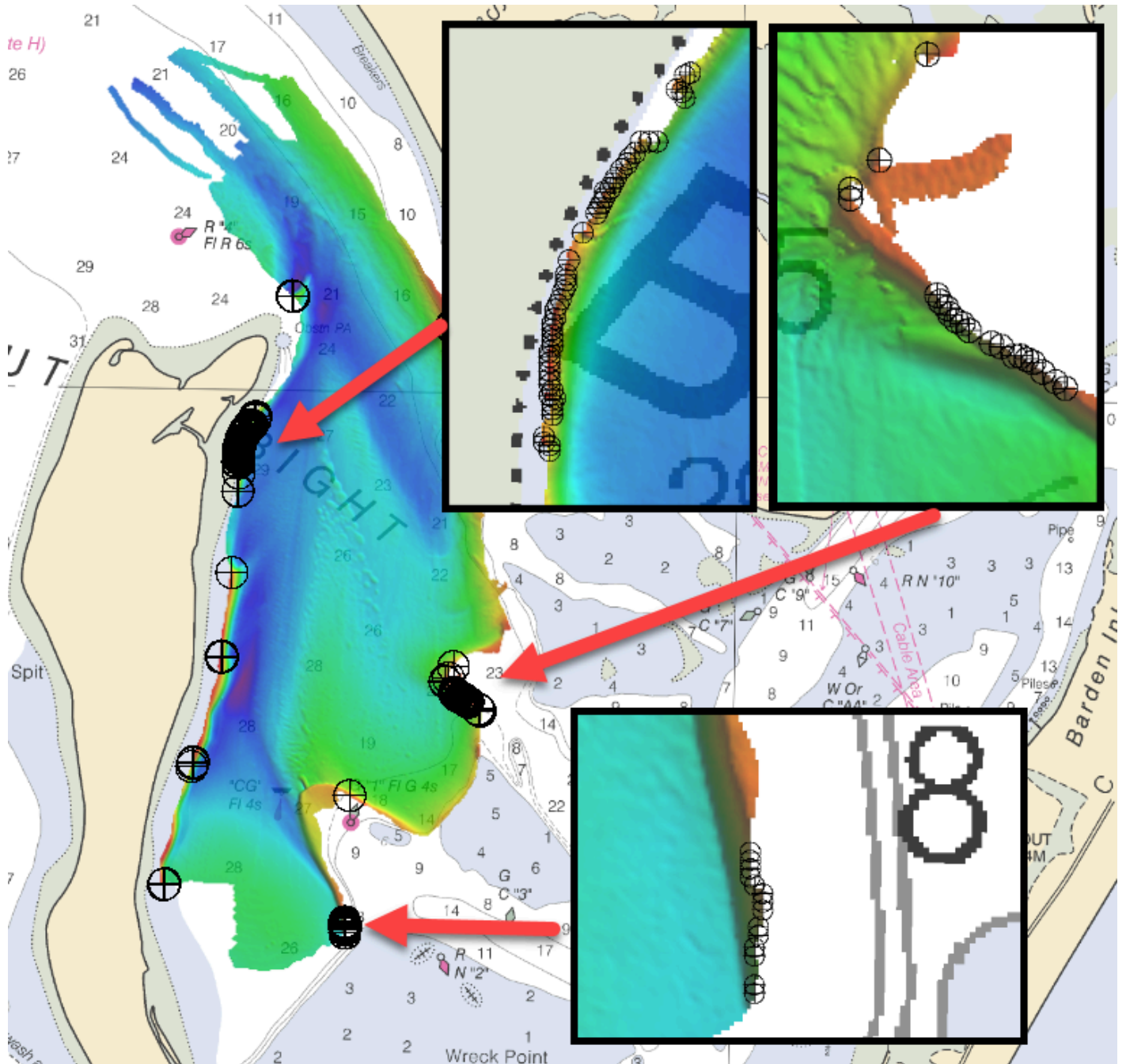


Figure 5: Overview of potential fliers flagged in F00866; all were examined and determined to be accurate representations of the seafloor.

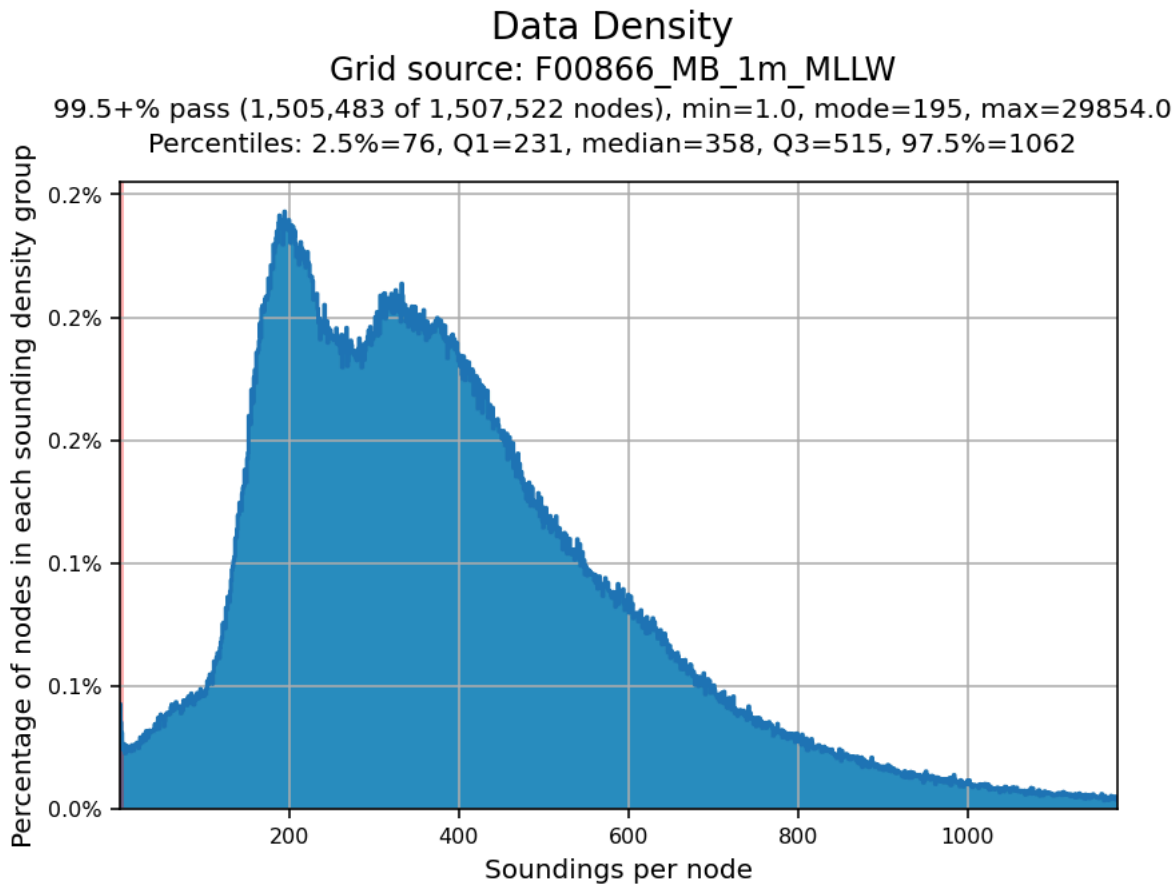


Figure 6: Pydro-derived plot showing HSSD density compliance of F00866 finalized 1-meter resolution surface.

G. Vertical and Horizontal Control

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

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

ERS via VDATUM was used with separation file Cape_Lookout_VDatumbkline(A)_100m_NAD83-MLLW_geoid12b.csar

Post Processed Real-Time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS 8.7 software to produce SBETs for horizontal and vertical corrections.

Additional information discussing the vertical control for this survey can be found in the accompanying 2022 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 18.

Post Processed Real-Time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS 8.7 software to produce SBETs for horizontal and vertical corrections.

Additional information discussing the horizontal control for this survey can be found in the accompanying 2022 DAPR.

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

H. Additional Results

Highly Changeable Area

Lookout Bight is one of the few places water exchanges between Onslow Bay and Back Sound, as such, the currents are extreme, causing the shoals to be highly dynamic. One portion of the seafloor along the eastern side of Lookout Bight was resurveyed in July, August and September. The edge of the shoal was noted to steadily migrate to the west (see image below).

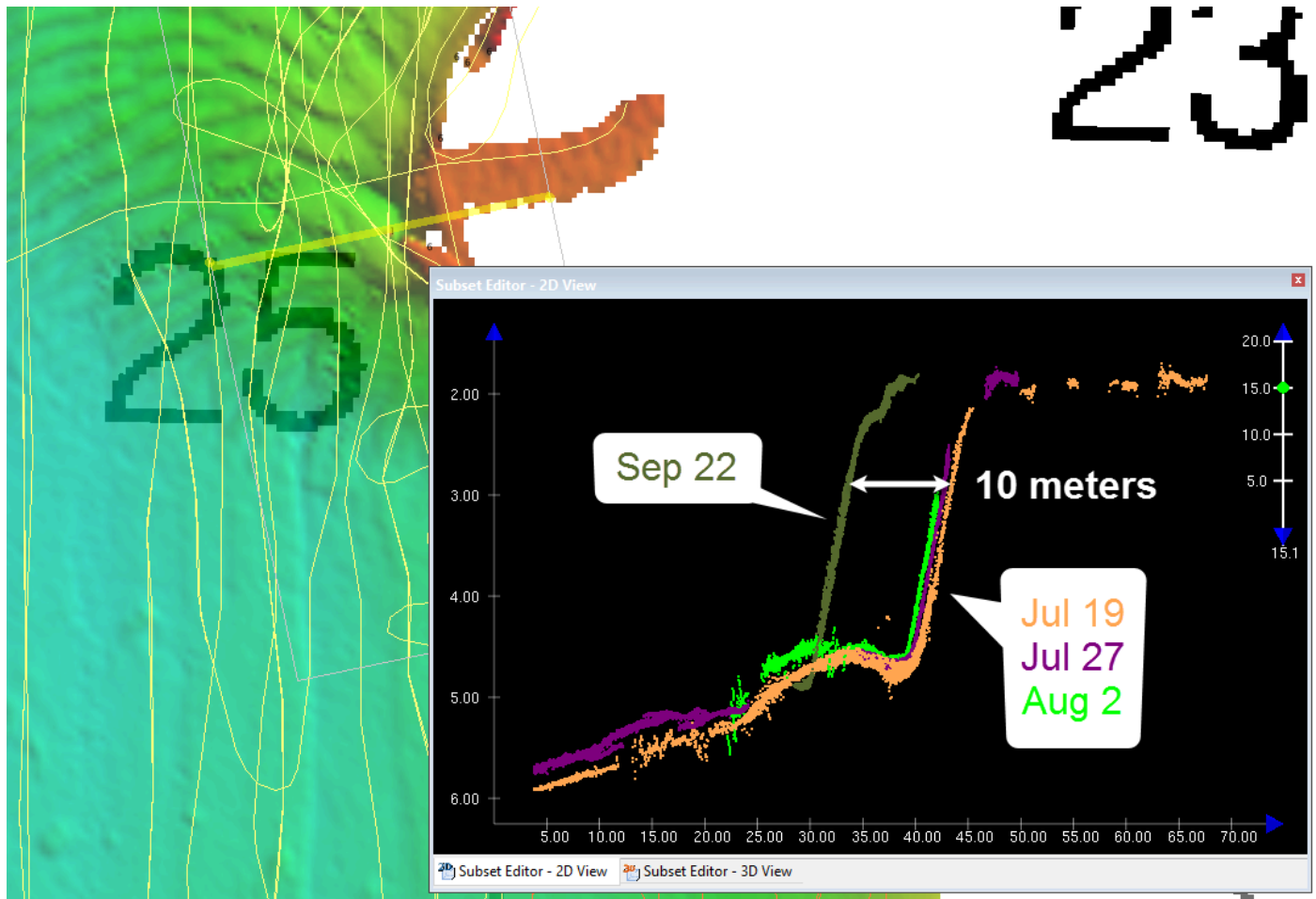


Figure 7: Steady migration of the leading edge of one shoal was noted over the course of the survey. Shoal migrated horizontally ~10 meters in 65 days.

Potential as Anchorage Area

NOAA Ship *Ferdinand R. Hassler* anchored within Lookout Bight on numerous occasions over the course of project OPR-F364-FH-22. The Bight provides extraordinary shelter from the seas in all directions. While the shore may not provide a significant wind break, the seafloor yields excellent holding ground for small to mid-sized vessels (at least to 150 feet, in length), and presents an alternative to vessels seeking shelter from the elements, but not wanting to pursue moorage in Morehead City, NC.

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
Michael Gonsalves, CDR/NOAA	Chief of Party	11/21/2022	GONSALVES.MICHAEL. OLIVER.1275635126 <small>Digitally signed by GONSALVES.MICHAEL.OLIVER.127 5635126 Date: 2022.11.23 15:03:07 -05'00'</small>
Daniel Helmricks, LT/NOAA	Operations Officer	11/21/2022	
Michael Gonsalves, CDR/NOAA	Sheet Manager	11/21/2022	GONSALVES.MICHAEL. .OLIVER.1275635126 <small>Digitally signed by GONSALVES.MICHAEL.OLIVER.127 5635126 Date: 2022.11.23 15:02:48 -05'00'</small>