

F00848

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00848

LOCALITY

State(s): Massachusetts

General Locality: Southern Cape Cod

Sub-locality: Pollock Rip Channel

2022

CHIEF OF PARTY
Matthew J. Jaskoski, CDR/NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00848

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): **Massachusetts**

General Locality: **Southern Cape Cod**

Sub-Locality: **Pollock Rip Channel**

Scale: **20000**

Dates of Survey: **04/15/2022 to 04/15/2022**

Instructions Dated: **01/25/2022**

Project Number: **OPR-D304-TJ-22**

Field Unit: **NOAA Ship *Thomas Jefferson***

Chief of Party: **Matthew J. Jaskoski, CDR/NOAA**

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 19N, 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 F00848, located in Southern Cape Cod's Pollock Rip Channel, was conducted in accordance with requirements set forth in the Project Instructions (PI) OPR-D304-TJ-22 (Figure 1).

F00848 was an opportunistic survey to meet a long-standing U.S. Coast Guard survey request. Due to operational time constraints the field unit completed 75 meter set line spacing in the northern section of the sheet. The hydrographers developed the area properly based on the depths of the water to survey the general nature of the area. The purpose of this survey is to get a better understanding of the charted soundings, and to better allocate future resources to this survey area.

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 34' 17.98" N 69° 57' 36.62" W	41° 32' 36.8" N 69° 54' 31.34" W

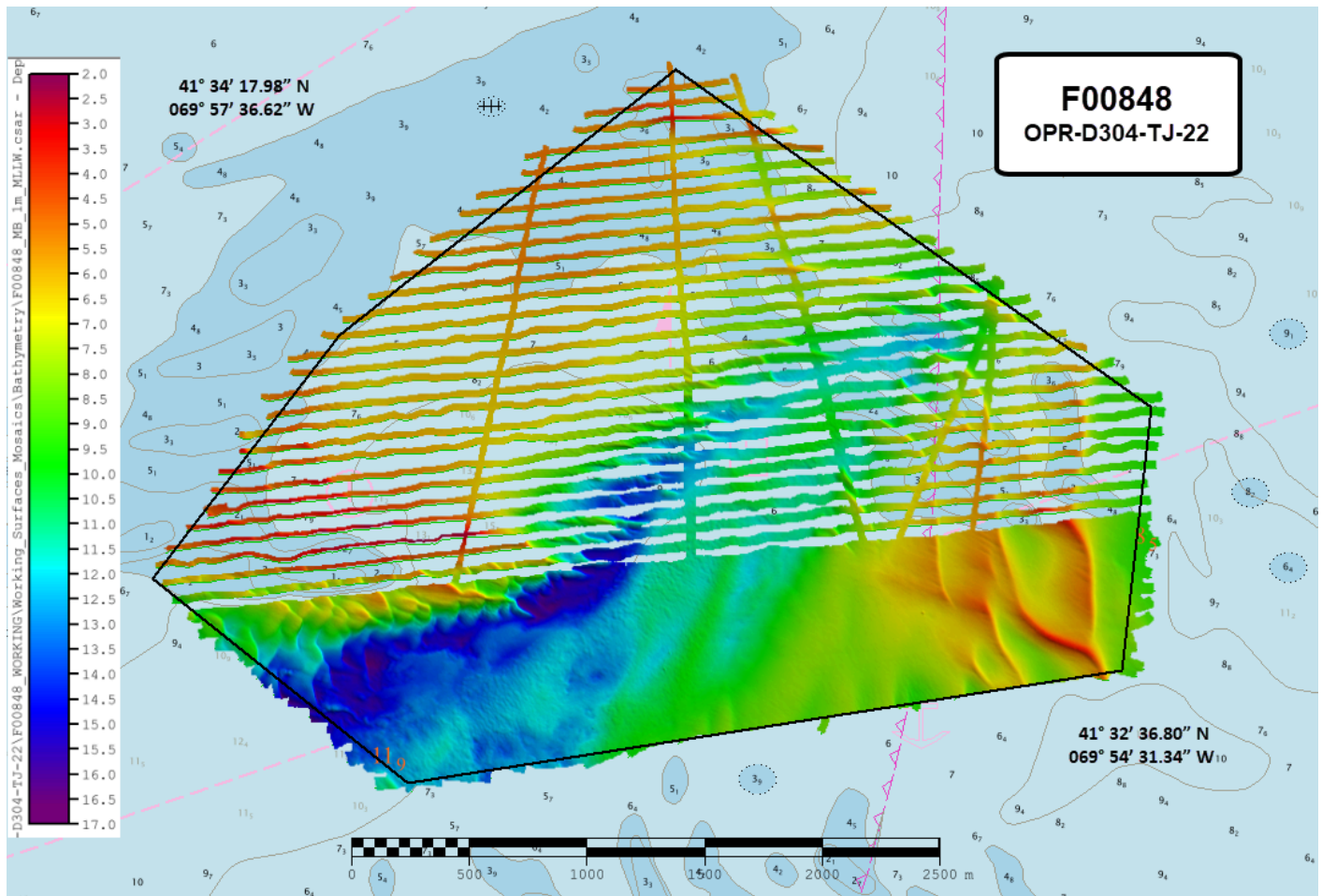


Figure 1: Survey layout for F00848, plotted over ENC US5MA42M. Black outline represents the survey limits set forth by the Project Instructions.

B. Survey Purpose

This survey was conducted in response to requests from the U.S Coast Guard for modern hydrography in the Pollock Rip Channel vicinity, 3NM east of Monomoy, Massachusetts. Due to the transitory nature of the local shoals, this survey was needed to verify changes since the last surveys in 1978 and 2001. The Pollock Rip Channel, a federally maintained natural channel, is the most direct entrance into Nantucket Sound from Cape Cod. This area is frequented by small fishing vessels and pleasure craft seeking a shorter route to avoid the more seaward Great Round Shoal Channel. Large passenger ferries also pass through Pollock Rip Channel.

The data from this survey will provide modern bathymetry for updating National Ocean Service nautical charting products and services as well as support the Seabed 2030 global mapping initiative.

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.

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

2903 (Figure 2):

- LOA: 8.5 meters
- Draft: 1.2 meters

2904 (Figure 3):

- LOA: 8.5 meters
- Draft: 1.2 meters



Figure 2: Thomas Jefferson HSL 2903



Figure 3: Thomas Jefferson HSL 2904

E. Uncertainty

The following survey specific parameters were used for this survey:

Survey Specific Tide TPU values:

- ERS via VDATUM measured: 0.0 meters
- ERS via VDATUM zoning: 0.13 meters

Survey Specific Sound Speed TPU values for 2903 and 2904:

- Measured CTD: 4 meters/second
- Surface: 0.2 meters/second

The bathymetric surface's uncertainty layer is compliant with 2022 HSSD uncertainty standards. Over 99.5% of all nodes pass uncertainty standards (Figure 4).

Hydrographic Survey Launch (HSL) 2903 collected a total of 6.67 linear nautical miles of MBES crosslines or 6.9% of mainscheme data. Crossline data did meet the 4% specification set by the 2022 HSSD. The crosslines acquired represent good spatial and depth diversity for this survey area (Figure 5). A 1m resolution Combined Uncertainty and Bathymetry Estimator (CUBE) surface of mainscheme data and a 1m CUBE surface of crossline data were differenced - the resulting mean was 0.01m with a standard deviation of 0.04m (Figure 6). Visual inspection of the difference surface indicated no systematic issues.

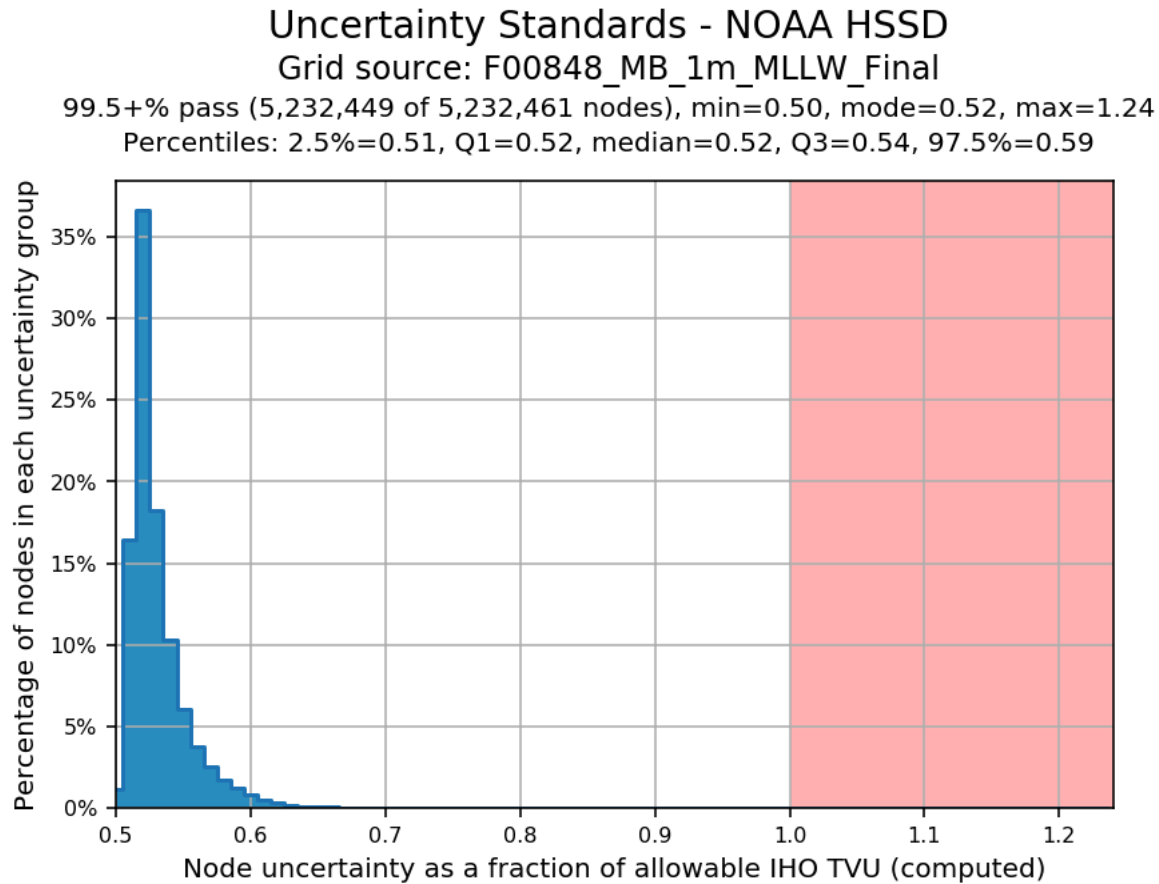


Figure 4: F00848 uncertainty standards.

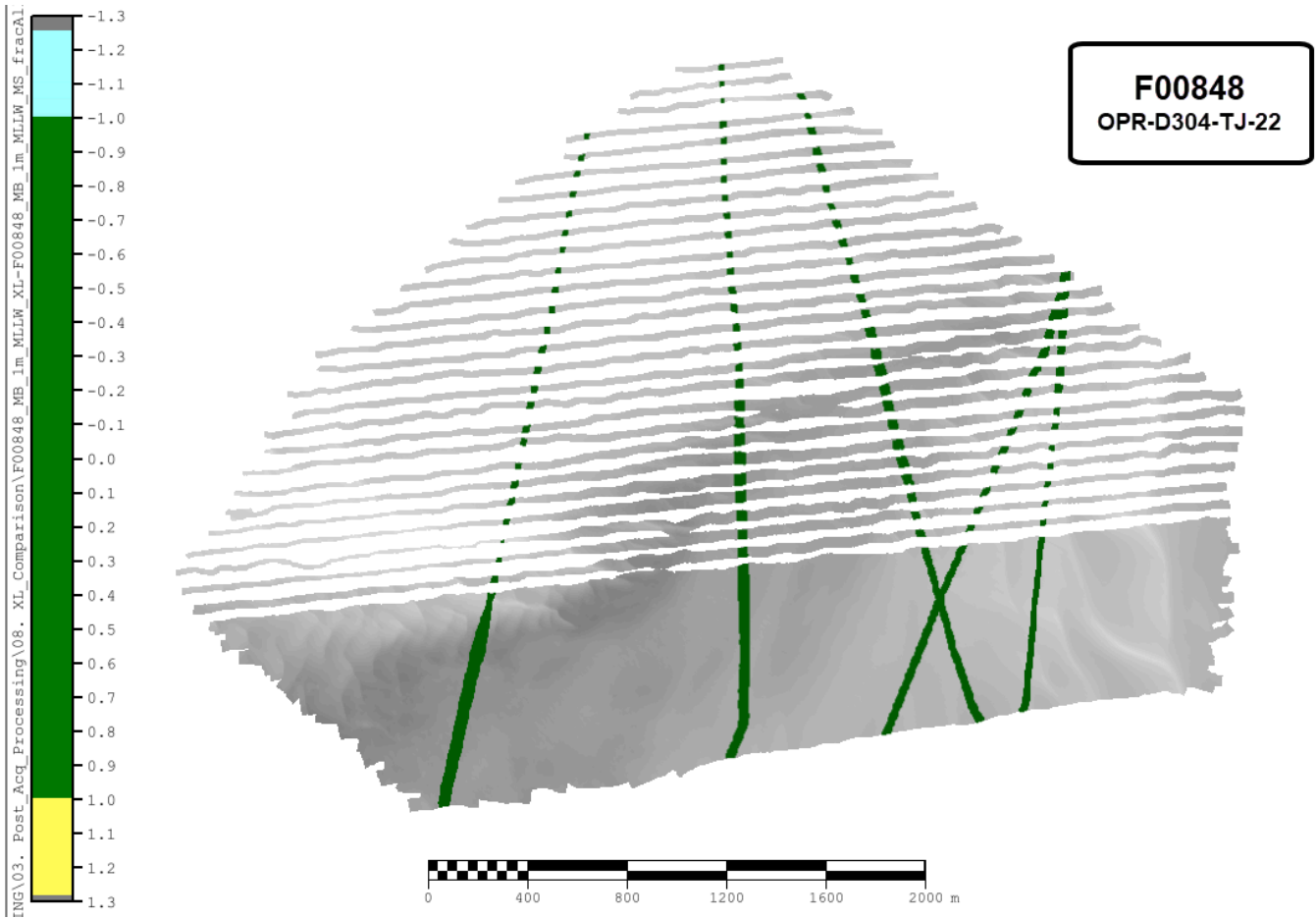


Figure 5: F00848 MBES crossline data, shown in fraction of allowable error difference statistics (color), overlaid on mainscheme data, shown in greyscale.

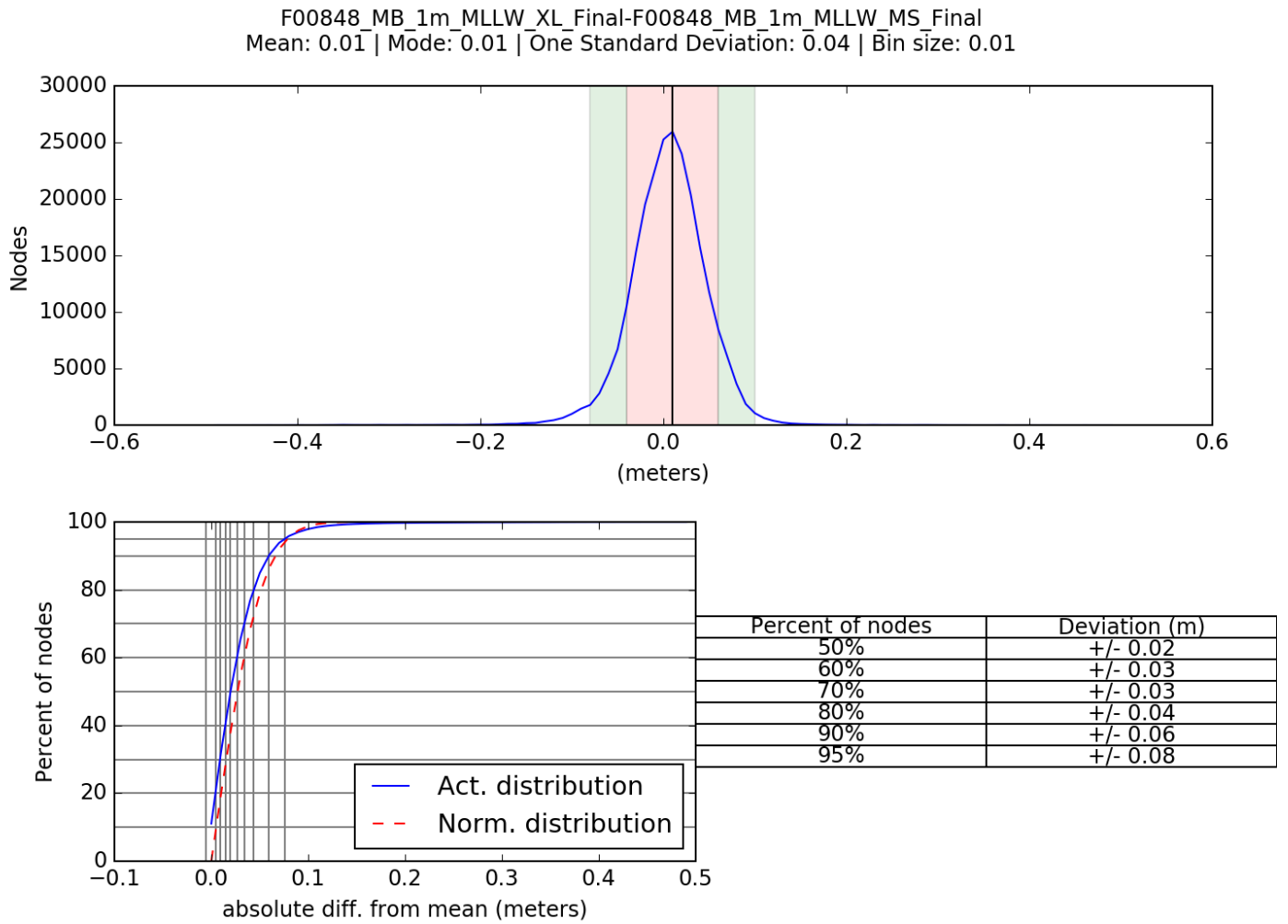


Figure 6: F00848 crossline/mainscheme comparison statistics.

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
US5MA42M	1:40000	6	10/27/2021	11/16/2022

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00848_MB_1m_MLLW_1of2	CARIS Raster Surface (CUBE)	1 m	2.1184 m - 16.569 m	NOAA_1m	MBES Set Line Spacing
F00848_MB_1m_MLLW_1of2_Final	CARIS Raster Surface (CUBE)	1 m	2.1184 m - 16.569 m	NOAA_1m	MBES Set Line Spacing
F00848_MB_1m_MLLW_2of2	CARIS Raster Surface (CUBE)	1 m	3.5155 m - 16.649 m	NOAA_1m	Complete MBES
F00848_MB_1m_MLLW_2of2_Final	CARIS Raster Surface (CUBE)	1 m	3.5155 m - 16.649 m	NOAA_1m	Complete MBES
F00848_MB_1m_MLLW	CARIS Raster Surface (CUBE)	1 m	2.113 m - 16.649 m	NOAA_1m	Complete MBES
F00848_MB_1m_MLLW_Final	CARIS Raster Surface (CUBE)	1 m	2.113 m - 16.649 m	NOAA_1m	Complete MBES
F00848_MBAB_2m_300kHz_1of2	MB Backscatter Mosaic	2 m	N/A	N/A	MBES Set Line Spacing
F00848_MBAB_2m_300kHz_2of2	MB Backscatter Mosaic	2 m	N/A	N/A	Complete MBES

Complete coverage requirements were met in the southern portion of the survey area by 100% complete coverage MBES as specified under section 5.2.2.3 of the 2022 HSSD. Due to an extreme limitation of operational time, the field unit chose to utilize set line spacing in the northern portion of the sheet in order to obtain a general understanding of soundings and contours in the area (Figure 1). Splits between set lines to address charted soundings were not acquired due to operational time constraints. Separate surfaces were created for set line spacing and complete coverage. An additional combined coverage surface was created and used for statistics and ensuring that acquired data met specifications.

After multiple rounds of surface cleaning, multiple fliers remain as detected by NOAA's QC Tool Flier Finder available in the Pydro XL-19 suite. All of the remaining fliers are on the edges of lines in highly dynamic sea floor areas and the number of fliers varies on each surface. These flagged nodes are considered to be accurate representations of the sea floor and have been retained in the submitted surfaces.

No holidays exist within the 100% complete coverage MBES and all bathymetric grids for F00848 meet density requirements per the 2022 HSSD (Figure 7).

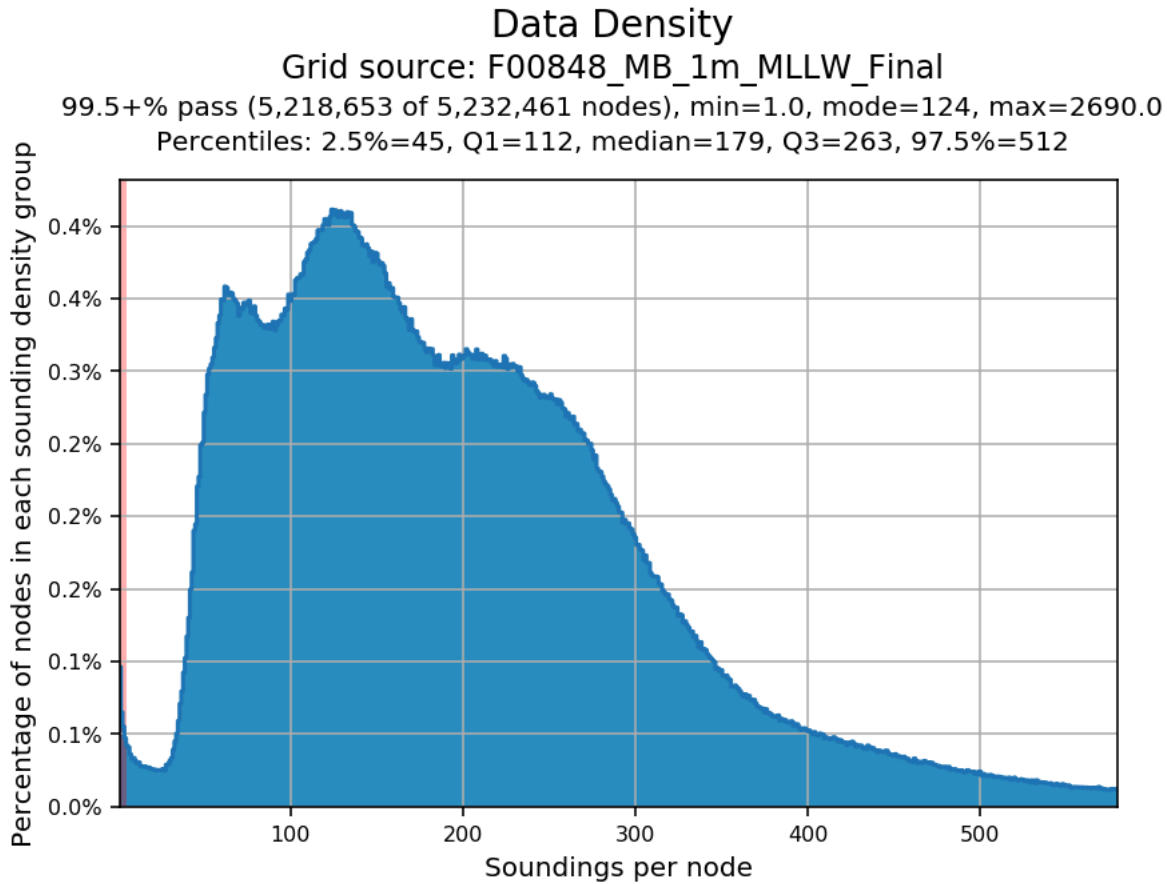


Figure 7: F00848 data density standards

The final deliverable surfaces (F00848_MB_1m_MLLW_1of2 and F00848_MB-1m_MLLW_2of2 met density and uncertainty requirements after Branch reprocessing.

G. Vertical and Horizontal Control

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

ERS via VDATUM was used to transform soundings measured at the ellipse to MLLW using separation file OPR-D304-TJ-22_NAD83_VDatum_MLLW_PollockRip.

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 19.

The following PPK methods were used for horizontal control:

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

H. Additional Results

Chart comparison

A chart comparison was conducted between survey F00848 and Electronic Navigational Chart (ENC) US5MA42M in accordance with the methods outlined in the DAPR. All data from F00848 are recommended to supersede charted data.

During chart comparison, numerous charted soundings and contours were not in agreement and a Danger to Navigation (Dton) report was submitted for F00848 (Figures 8 and 9). In lieu of utilizing the Dton processing procedure to implement chart updates, the survey will be flagged for priority processing upon delivery. Reference Appendix II included with the submission of this project for further information.

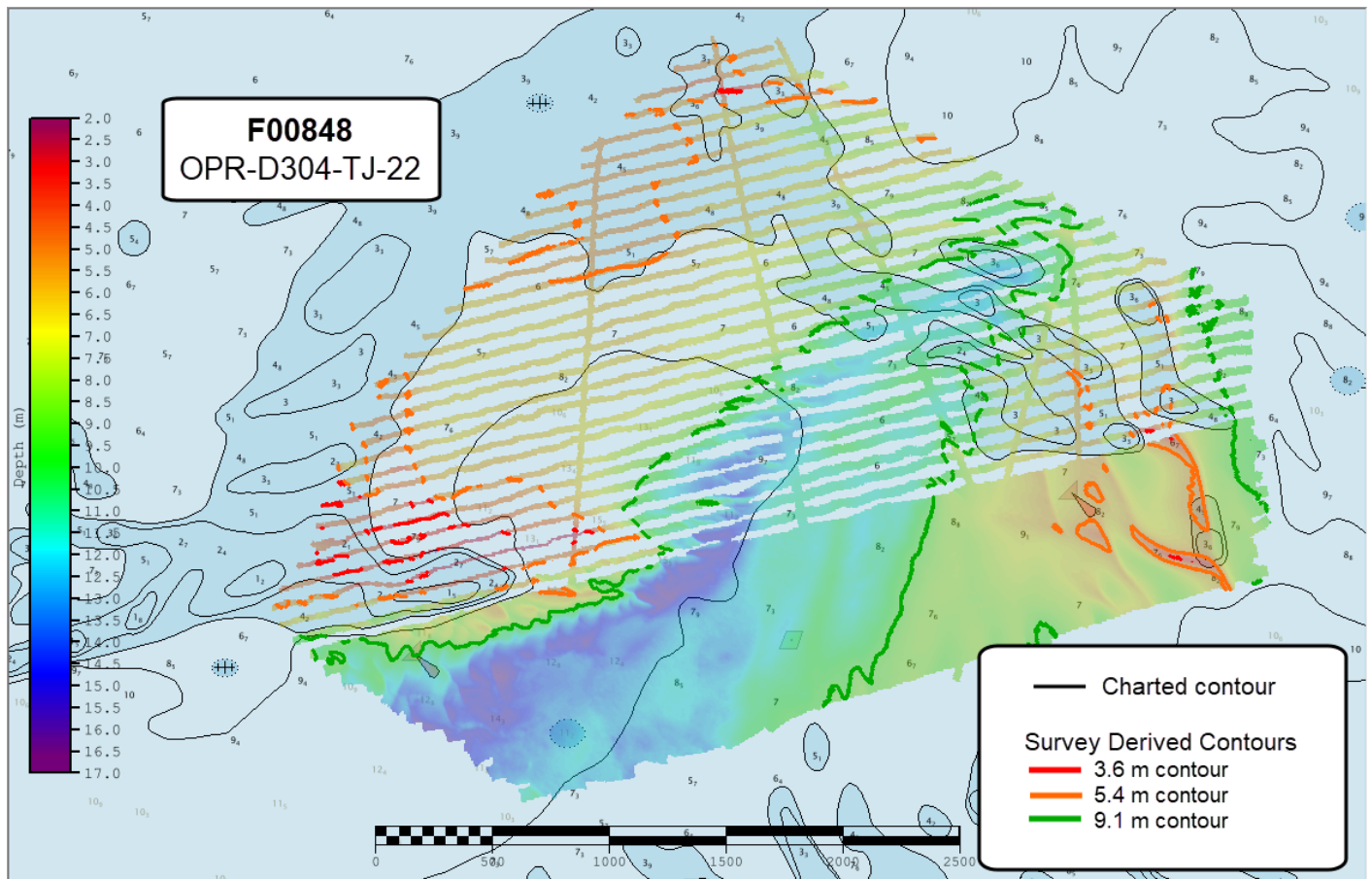


Figure 8: A comparison of the charted contours, shown in black, and the contours from acquired data, in red.

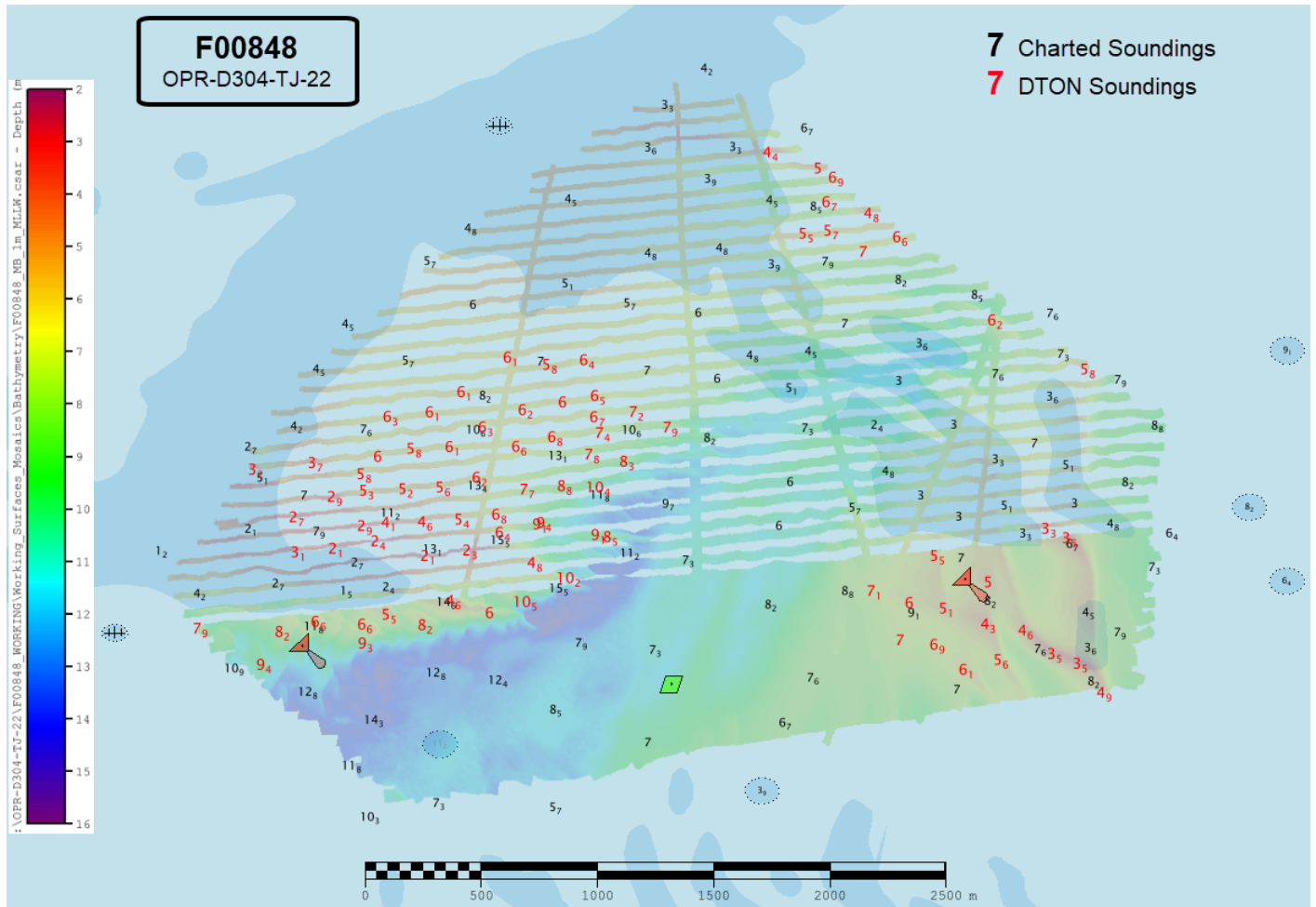


Figure 9: The location of soundings that are considered Dtons, shown in red, compared to the charted soundings, shown in black.

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
Matthew J. Jaskoski, CDR/NOAA	Commanding Officer/ Chief of Party	06/06/2022	
Michelle M. Levano. LT/NOAA	Field Operations Officer	06/06/2022	
Erin Cziraki	Chief Survey Technician	06/06/2022	
Chloe Arboleda	Sheet Manager	06/06/2022	