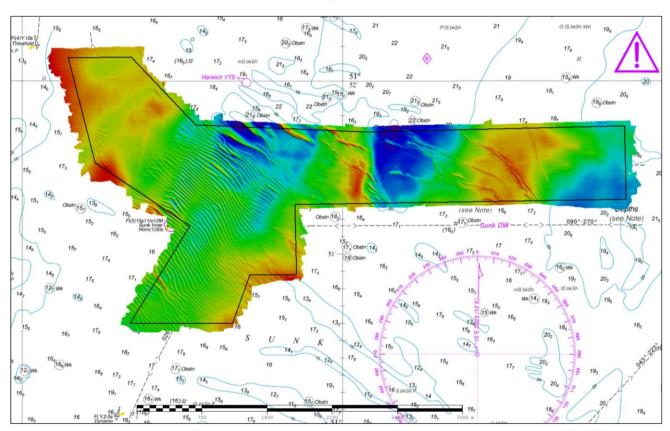


THAMES ESTUARY SUNK FOCUSED (TE3A) 2023 ASSESSMENT

An assessment of the 2023 hydrographic survey of the area TE3A: to monitor recent seabed movement; to identify any implications for shipping; and to make recommendations for future surveys.



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Notes

This Assessment is produced by the UK Hydrographic Office (UKHO) for the Maritime and Coastguard Agency (MCA). Analysis of the Routine Resurvey Areas forms part of the Civil Hydrography Programme and the reports are made available through the UKHO website and are presented to the Civil Hydrography Working Group. When approved, the recommendations are incorporated into the Routine Resurvey Programme. The report is governed by a Memorandum of Understanding between the DfT (including the MCA) and the MOD (including the UKHO).

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No analysis of shipping traffic has been included within this report due to no AIS data being supplied by MCA.

All depths are to Chart Datum, defined using the UKHO Vertical Offshore Reference Frame (VORF)

TE3A SUNK FOCUSED, 2023

1. SUMMARY

Changes Detected

- 1.1 The 2023 controlling depth in this survey area is 15.7m (+0.1m deeper than in 2022), with another notable depth of 15.8m (0.4m shallower than 2022) ~1.6km further west along the Harwich DWR. The majority of the Sunk DWR is not covered in this survey, as it is adequately covered by Port of London Authority (PLA) as part of their regular survey programme at intervals of approximately 8 months, see Figure 2b. The section that has been covered in TE3A is all deeper than 17.5m.
- 1.2 The sediment movements of the main sandwave movement area are on a horizontal scale of 30-140m between the 2023 and 2020 surveys towards SW, in the direction of or currently at the Harwich DWR. Outside of the clusters of sandwaves, depths remain stable.
- 1.3 Consistent with previous years, the greatest depth changes between the 2023 and 2022 survey are due to the sandwave migration.

Reasons for Continuing to Resurvey the Area

- 1.4 Depths in the area remain hazardous and changeable to deep draught vessels navigating the area. The cluster of sandwaves that appear to be moving most significantly are above the charted Harwich Deep-Water Route, therefore continued monitoring is required.
- 1.5 The Harwich DWR is now dredged to 16m, yet the shoal points in the 2023 TE3A survey are 15.7m and 15.8m, which are be navigationally significant for deep draught vessels bound for Felixstowe. The Sunk is the limiting point on the approach to London so requires continued monitoring.

Recommendations

- 1.6 Sandwaves continue to move both in SW and NE directions, adjacent to both Deep-Water Routes. Therefore the 3-year frequency for full surveys, with focused surveys in the intervening years, should be retained.
- 1.7 The full survey limits should be retained to ensure the location and depth of the mobile sandwaves are adequately charted. The focused survey limits were extended in 2023 to align with the eastern end of the full area, and to cover the 20m safety contour.

2. LOCATION

- 2.1 Survey interval at time of resurvey: 1-year Focused survey, 3 years for the Full area.
- 2.2 Area Covered: 8.04 km²

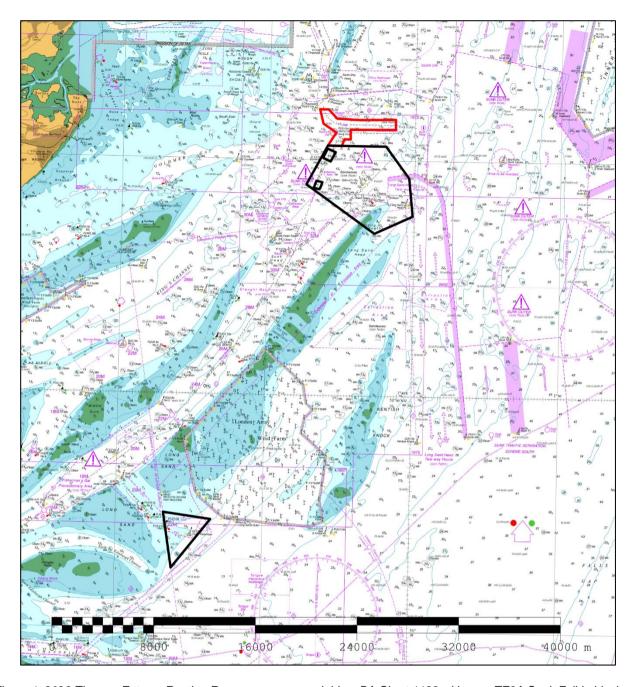


Figure 1: 2023 Thames Estuary Routine Resurvey areas overlaid on BA Chart 1183 with area TE3A Sunk Full in black and the 2023 TE3A Sunk Focused area inside in red.

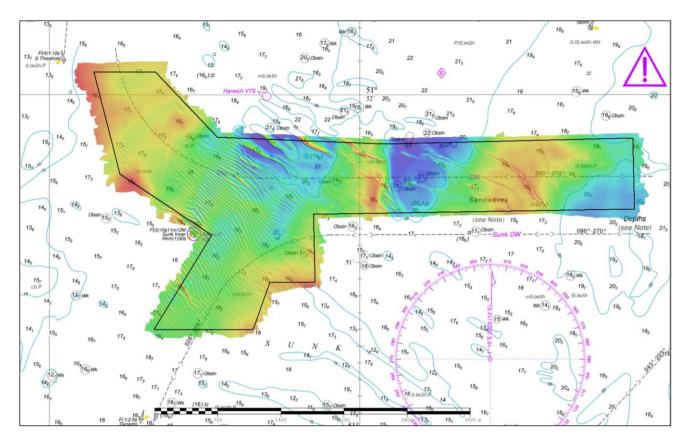


Figure 2a: 2023 survey data overlaid on BA Chart 2692

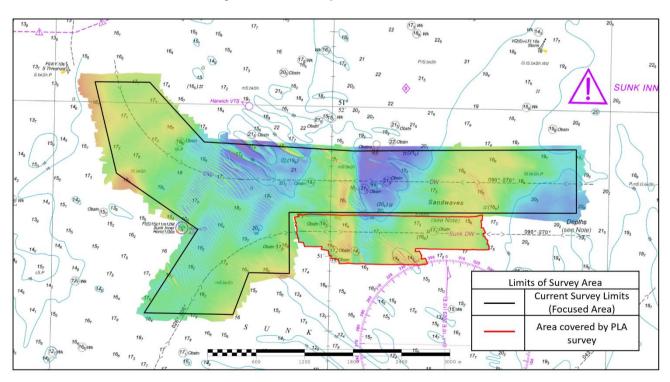


Figure 2b: 2023 TE3A survey data with HI polygon (black) and most recent 2023 Port of London Authority (PLA) survey data (outlined in red) overlaid on BA Chart 2692

3. REFERENCE SURVEY DETAIL

- 3.1 The previous focused surveys HI1739 and HI1691 were conducted as part of the 2021 and 2020 Routine Resurvey Programme in September 2021 and September 2020 respectively. The latest full survey HI1763 was conducted in June 2022.
- 3.2 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from the Admiralty Marine Data Portal.

4. NEW SURVEY DETAIL

- 4.1 HI1831 was surveyed between 8th-9th August 2023.
- 4.2 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from the Admiralty Marine Data Portal.

5. DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 5.1 Figure 3 shows the controlling and significant depths for Harwich DWR and Sunk DWR. In 2023 the Harwich DWR controlling depth is 15.7m (15.6m in 2022 at approximately the same location). Another critical sounding was also picked out further west along the Harwich DWR at 15.8m, which has shoaled by 0.4m since 2022. The majority of the Sunk DWR is not covered in this survey, however the short section that has been covered is all deeper than 17.5m.
- 5.2 The difference surfaces displayed in Figures 4, 5 & 6 show the movement of the sandwaves across the survey area between the 2020 to 2023 surveys. Sandwaves to the north of Harwich DWR show consistent trends of shifting laterally SW between the 2020 to 2023 surveys. A profile comparison is shown in Figure 4a to highlight the sandwave changes in position.
- 5.3 Figure 7 is a colour banded depth plot with selected differences between the 2023 and 2022 surveys. It highlights the movement of the sandwaves with the larger differences, alongside smaller-scale changes where there has been little change, consistent with previous years' data.
- 5.4 The greatest depth changes across the survey area are caused by the mobility of the sandwaves north of the Harwich DWR. The greatest changes in depth between 2022 and 2023 are -4.5m and +3.2m. These are seen in the patch of the significant sandwaves above the Harwich DWR.

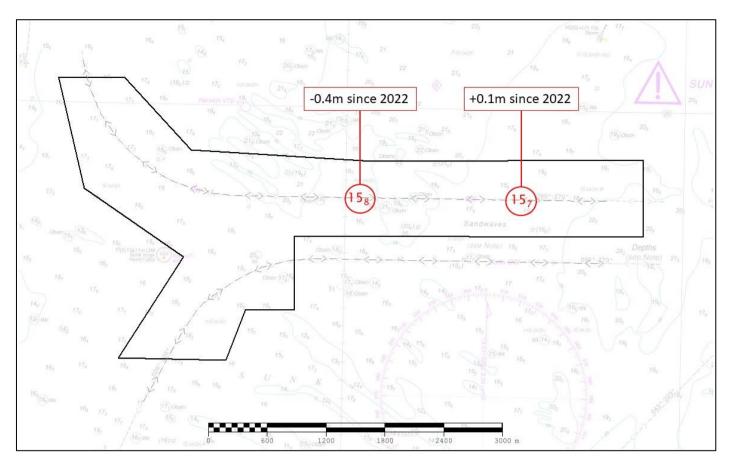


Figure 3: 2023 Controlling and significant depth soundings highlighted, overlaid on BA Chart 2692-0. Positive values (+) represent deepening. Negative values (-) represent shoaling.

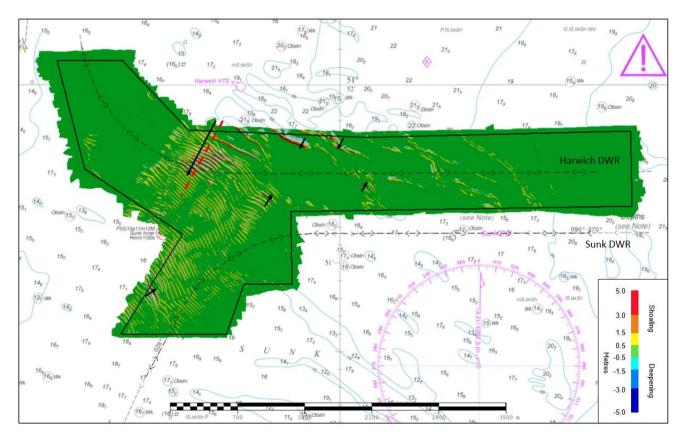


Figure 4: Difference surface showing bathymetric changes between the 2023 and 2022 surveys overlaid on BA Chart 2692 (Black arrows represent sandwave migration since 2022 survey). Red dashed line indicate location of profile (Figure 4a).

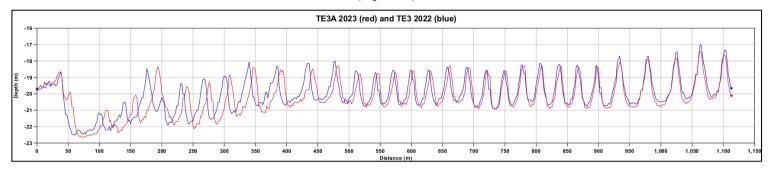


Figure 4a: Profile comparison between the 2023 and 2022 surveys. Profile line is indicated by dashed red line in Figure 4 above.

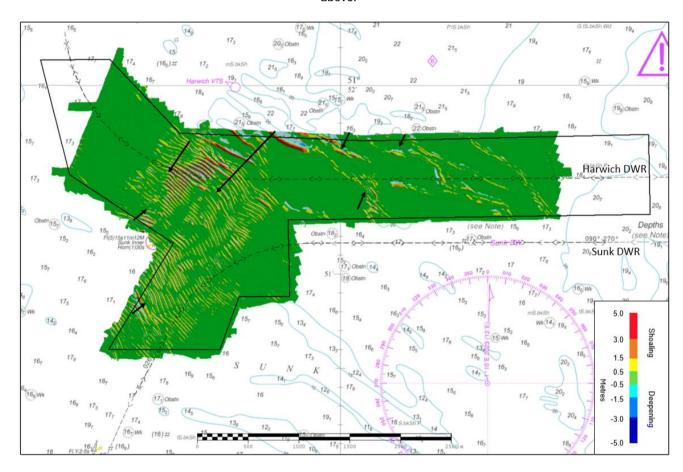


Figure 5: Difference surface showing bathymetric changes between the 2023 and 2021 surveys overlaid on BA Chart 2692 (Black arrows represent sandwave migration since 2021 survey)

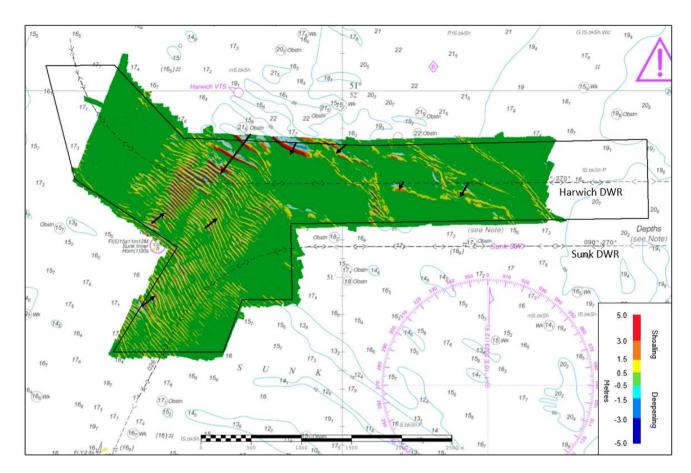


Figure 6: Difference surface showing bathymetric changes between the 2023 and 2020 surveys overlaid on BA Chart 2692 (Black arrows represent sandwave migration since 2020 survey)

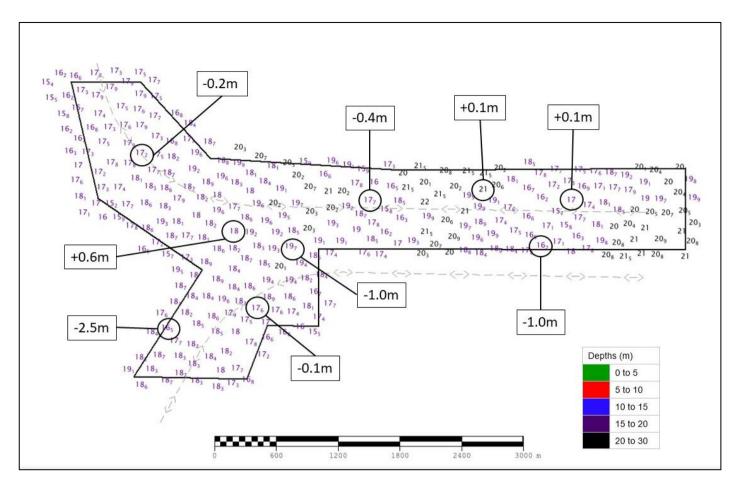


Figure 7: Colour banded depth plot from the 2023 survey with selected depth changes since the 2022 survey.

Positive values (+) represent deepening. Negative values (-) represent shoaling.

6. RECOMMENDATIONS FOR FUTURE SURVEYS

Survey Interval

6.1 Despite much of the survey area remaining consistent in the last year, there is obvious overall mobility of sandwaves in both SW and NE directions, adjacent to both Deep-Water Routes. Therefore, the 3-year frequency for full surveys, with focused survey in the intervening years, should be retained.

Survey Area

6.2 No new recommendations on survey area limits since CHWG 2022, the agreed limits should be retained. The eastern sections of the full and focused survey areas were extended in 2022 to encompass the 20m contour.