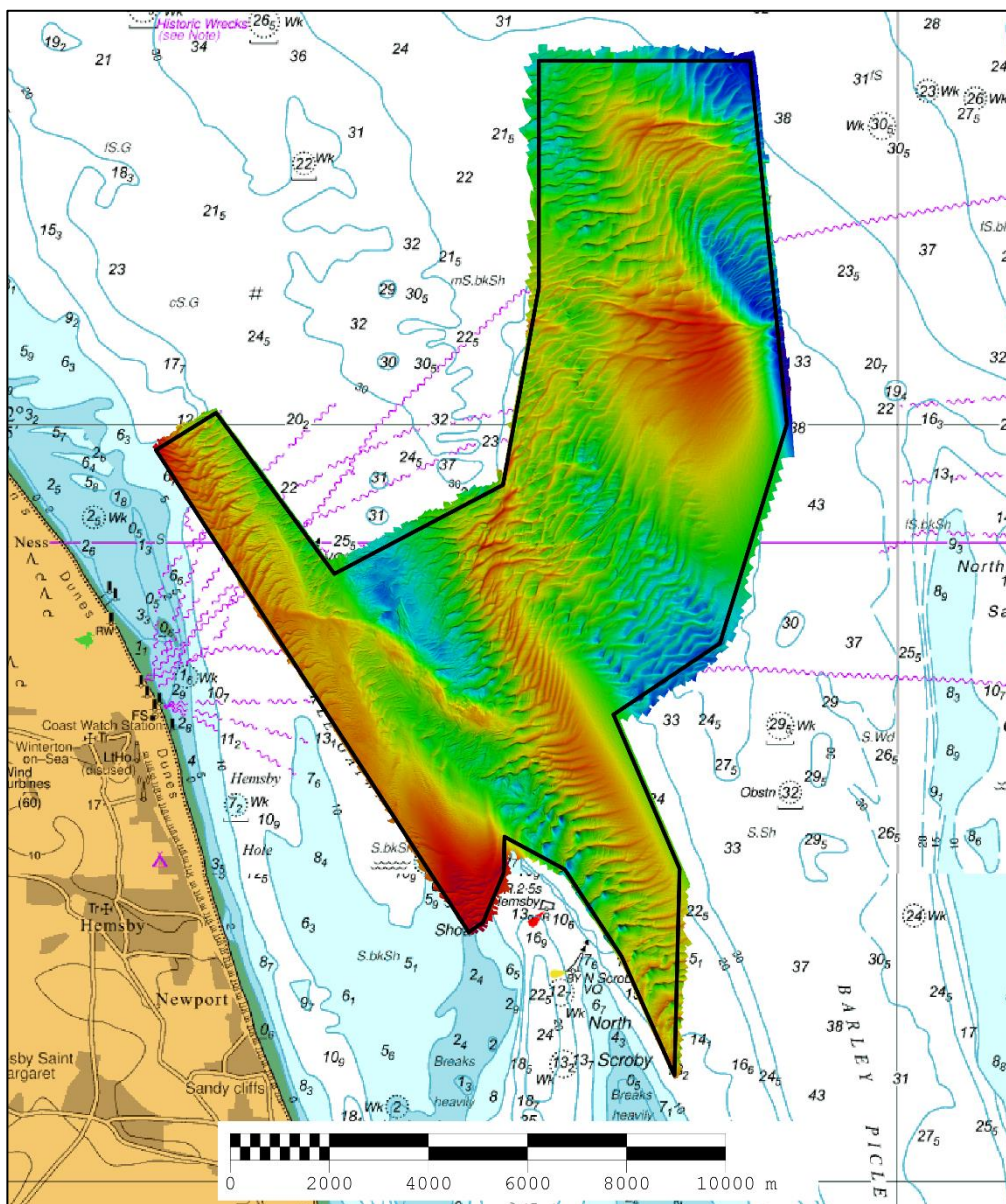




UK Hydrographic  
Office

## EAST ANGLIA COCKLE GATEWAY FULL (EA1) 2023 ASSESSMENT

An assessment of the 2023 hydrographic survey of the area EA1: 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) Model.

## **COCKLE GATEWAY FULL- EA1, 2023**

### **1. SUMMARY**

#### **Changes Detected**

- 1.1 Moving sandwaves are causing localised deepening and shoaling over the entire area with shoals migrating north, but the general depth has not changed.

#### **Reasons for Continuing to Resurvey the Area**

- 1.2 Shoals in the area remain mobile and are potentially hazardous to vessels navigating in the area and therefore require continued monitoring through 12-year full resurveys.

#### **Recommendations**

- 1.3 The current full 12-year survey interval is adequate together with a focused area every 6-years to monitor any changes to the seabed and their effect on vessel navigation. No change is recommended at this time.
- 1.4 The current limits for EA1, Full and Focused, are sufficient to capture the current and future seabed change and shoals. No changes to the survey limits are required.

### **2. LOCATION**

- 2.1 Survey interval at time of resurvey: 12 years full area, 6 years focused in between.
- 2.2 Area Covered: 38.6 km<sup>2</sup>.

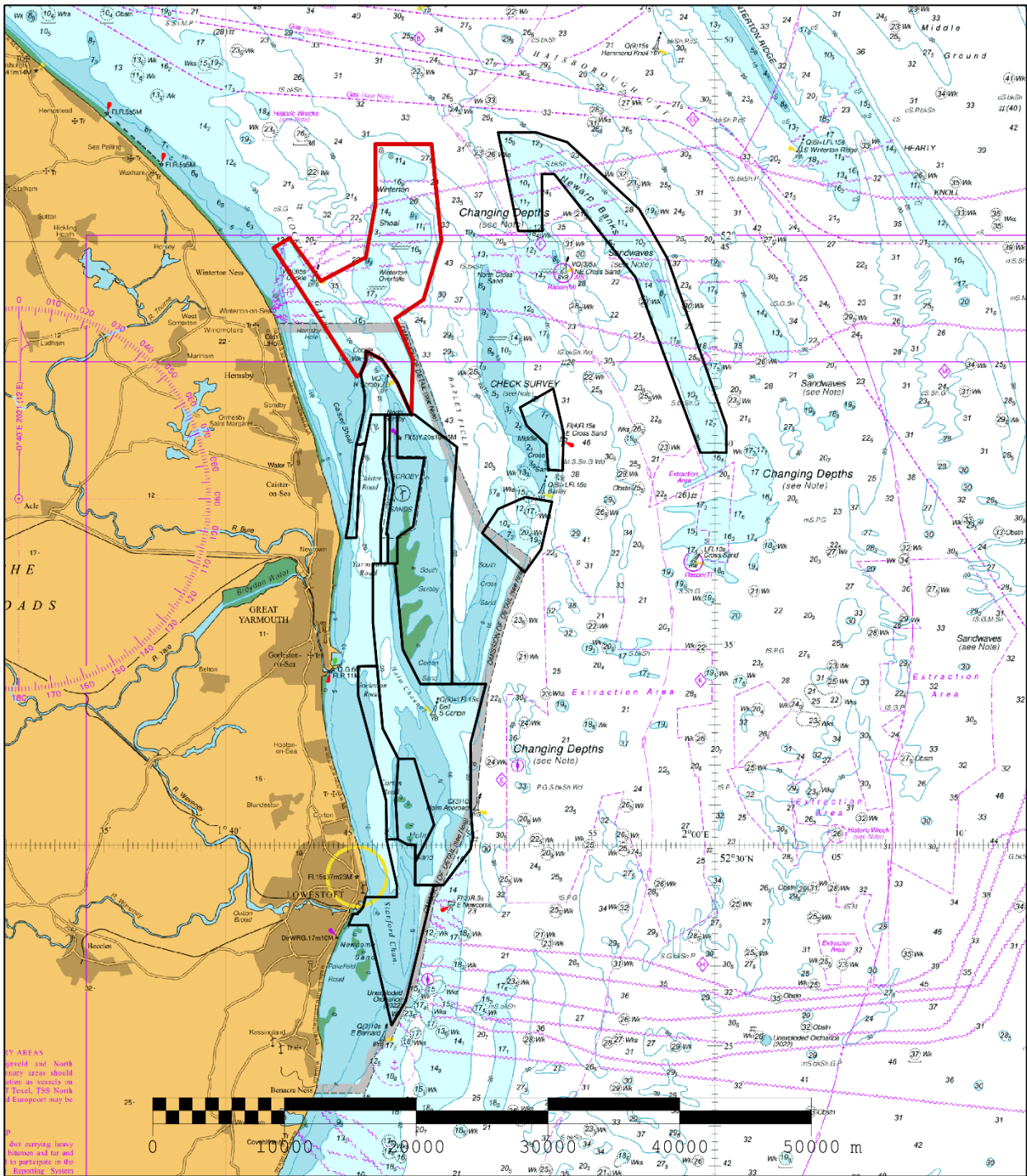


Figure 1: 2023 East Anglia Routine Resurvey areas overlaid on BA Chart 1504 with area EA1 Full in red.

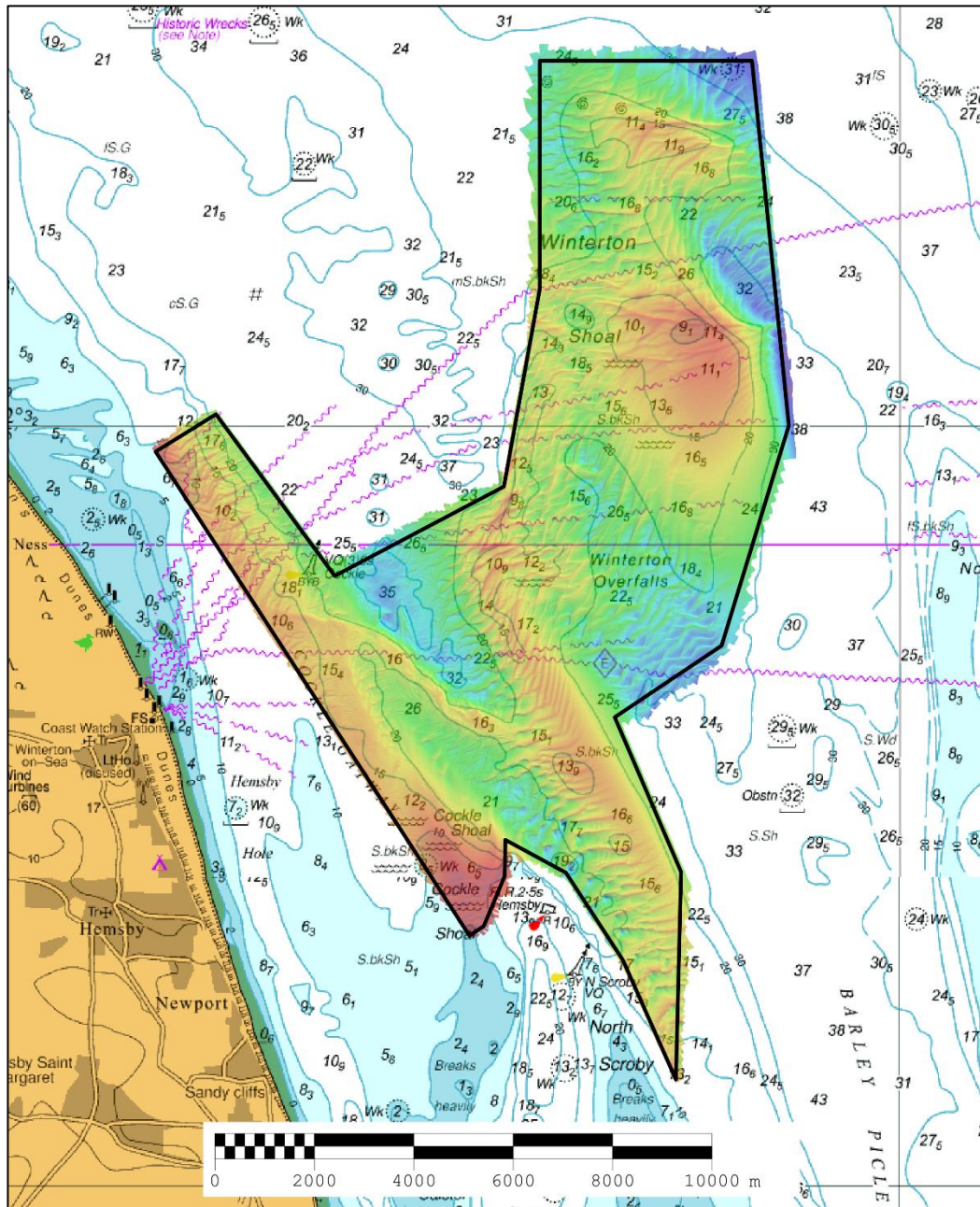


Figure 2: 2023 survey data overlaid on BA Charts 106 and 1543

### 3. REFERENCE SURVEY DETAIL

- 3.1 The previous focused survey was conducted as part of the 2017 Routine Resurvey Programme, CHP between May and July 2017 as part of HI1545.
- 3.2 The previous full survey was conducted as part of the 2011 Routine Resurvey Programme, CHP between May and July 2011 as part of HI1367.
- 3.3 The Report of Survey for these surveys are 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 The latest full survey was collected as part of the 2023 Routine Resurvey Programme, CHP between the 15<sup>th</sup> of September and 1<sup>st</sup> of October 2023 as part of HI1821.
- 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 that the controlling depth in the 2023 survey is 9.8 meters, located in the northeast of the survey area. Another depth of 9.9 meters in the centre of the survey area has moved 1.2km southwest compared to the controlling depth of 2017. Both depths are deeper compared to the reported controlling depths of 2017.
- 5.2 The difference surface in Figure 4 shows the depth change across the surveyed area between 2023 and 2017. The change ranges between -13.6 and 11.9m. Figure 5 shows the depth change between the 2023 and 2011 survey, ranging between -20.0 and 17.7m change. Although large depth changes can be seen in both difference surfaces the depth change is caused by localised deepening and shoaling due to the movement of the bedforms. The average depths across the area are mostly unchanged. Overall, the general depths across the area do not differ enough to affect ship routing through the area.
- 5.3 The 15m contour plot (Figure 6) shows the migration of the Winterton Shoal north-easterly by 200-300m between both 6-year survey periods. Other shoals highlighted in Figure 6 have migrated north by shorter distances. The migration of the Winterton Shoal will be adequately captured in the previously agreed extended focused survey limits shown in Figure 6. The 10m contour will be fully captured (Not pictured).
- 5.4 Figure 6 shows the appearance of 15m sandwave contours NE of Cockle Shoal down the centre of the survey area in 2023. Examination of the bathymetric surfaces 2011-2023 confirm the continued presence of the sandwaves across the area. The 2023 survey had higher profile sandwaves, possibly caused by the difference in the season the surveys were collected. The average depth of the area as a whole is generally unchanged between the 2017 and 2023 surveys. Depth profiles of the area are shown in Figure 7. Continued monitoring of the sandwave area is recommended to confirm it is not shoaling.

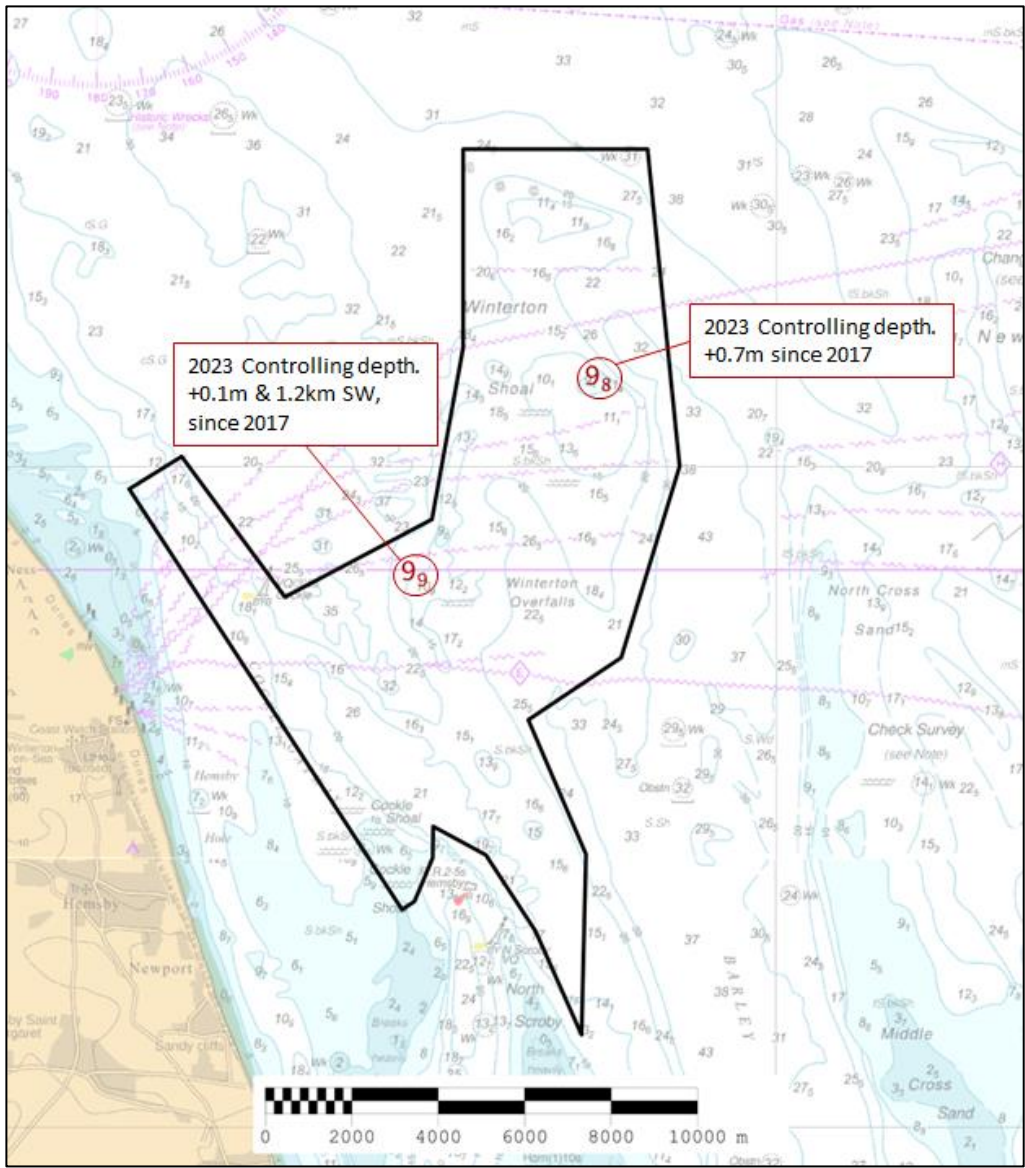


Figure 3: Controlling Depth soundings highlighted, overlaid on BA Charts 1543 and 106.

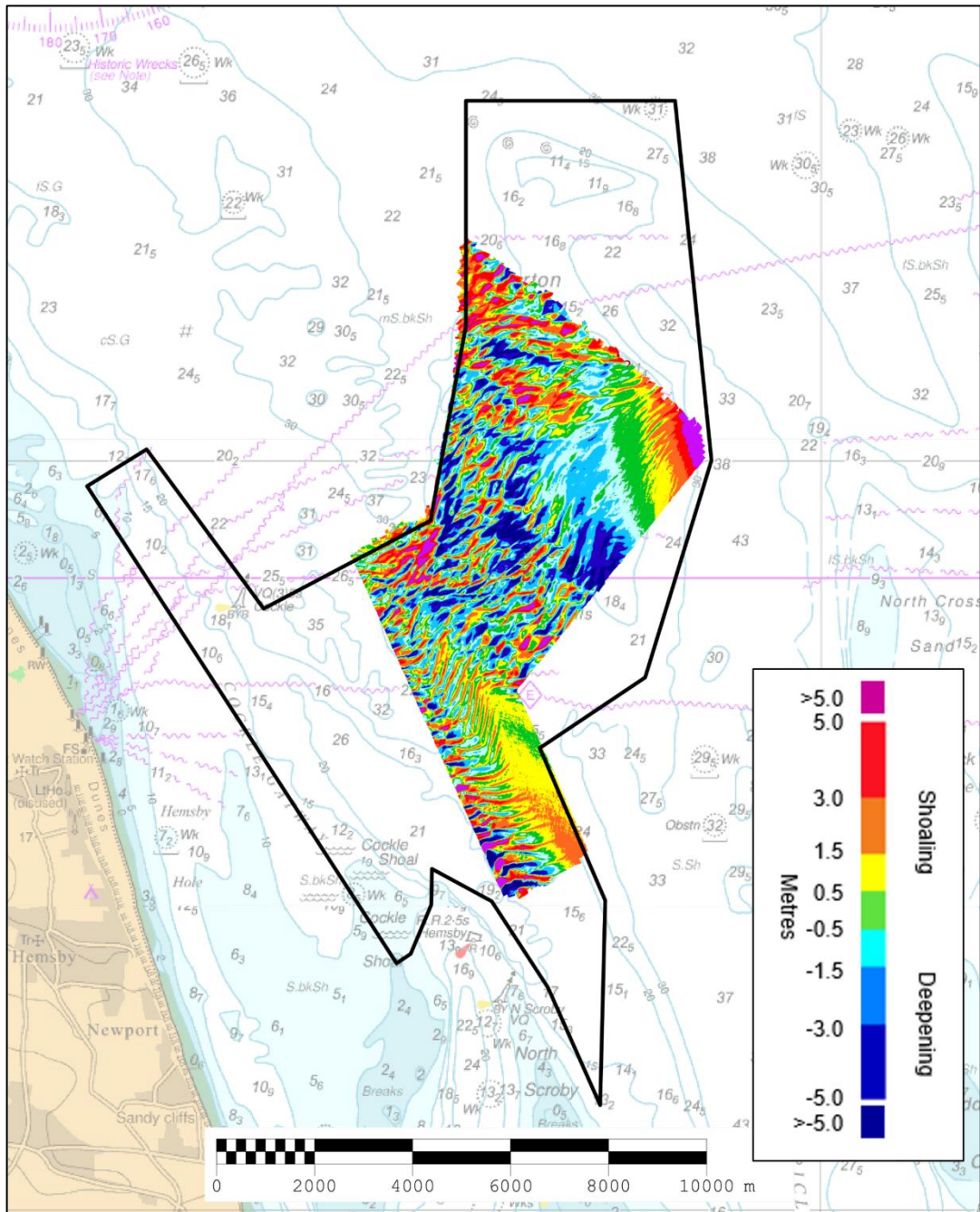


Figure 4: Difference surface showing bathymetric changes between the 2023 (full) and 2017 (focused) surveys overlaid on BA Charts 1543 and 106.



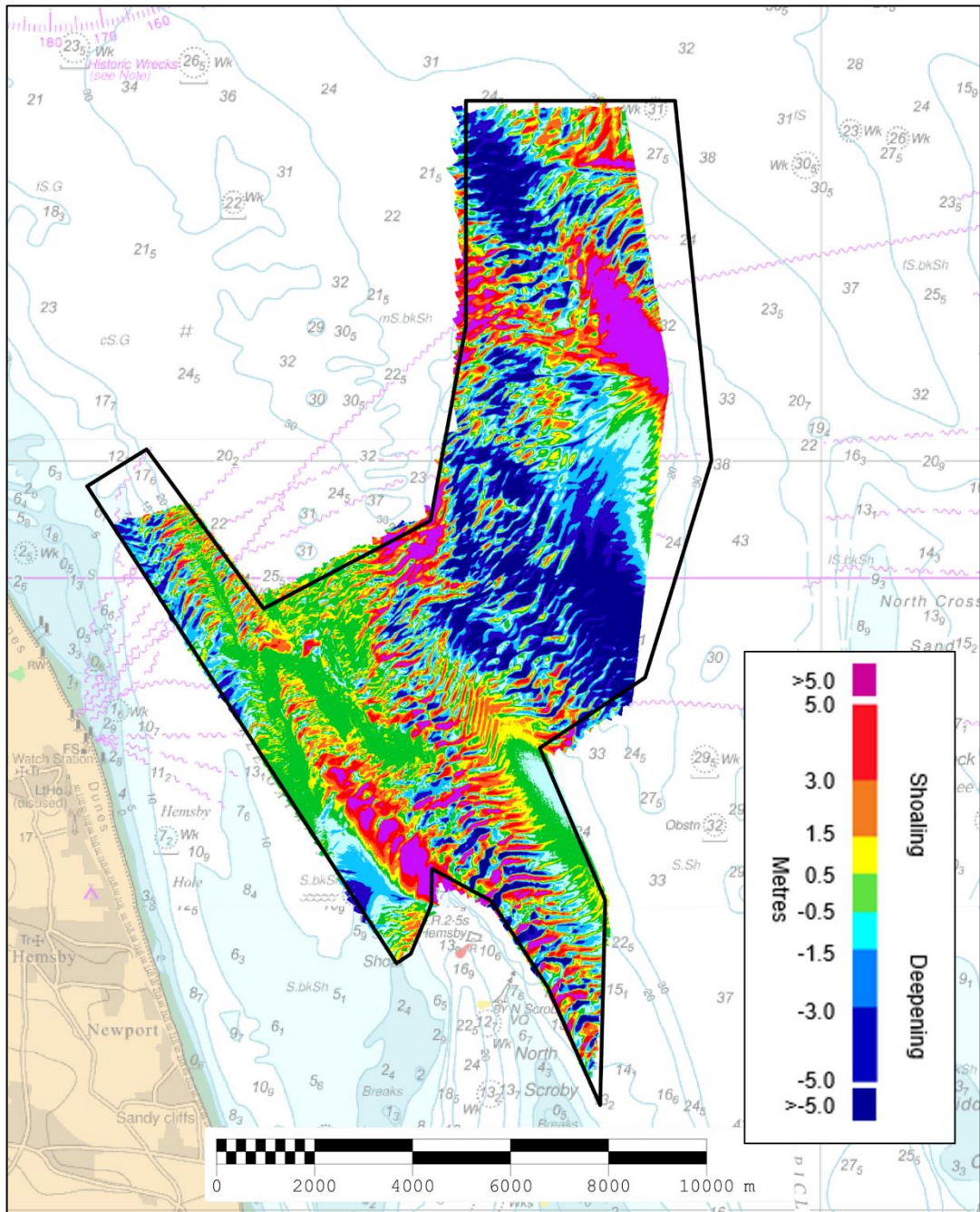


Figure 5: Difference surface showing bathymetric changes between the 2023 and 2011 full surveys overlaid on BA Charts 1543 and 106.

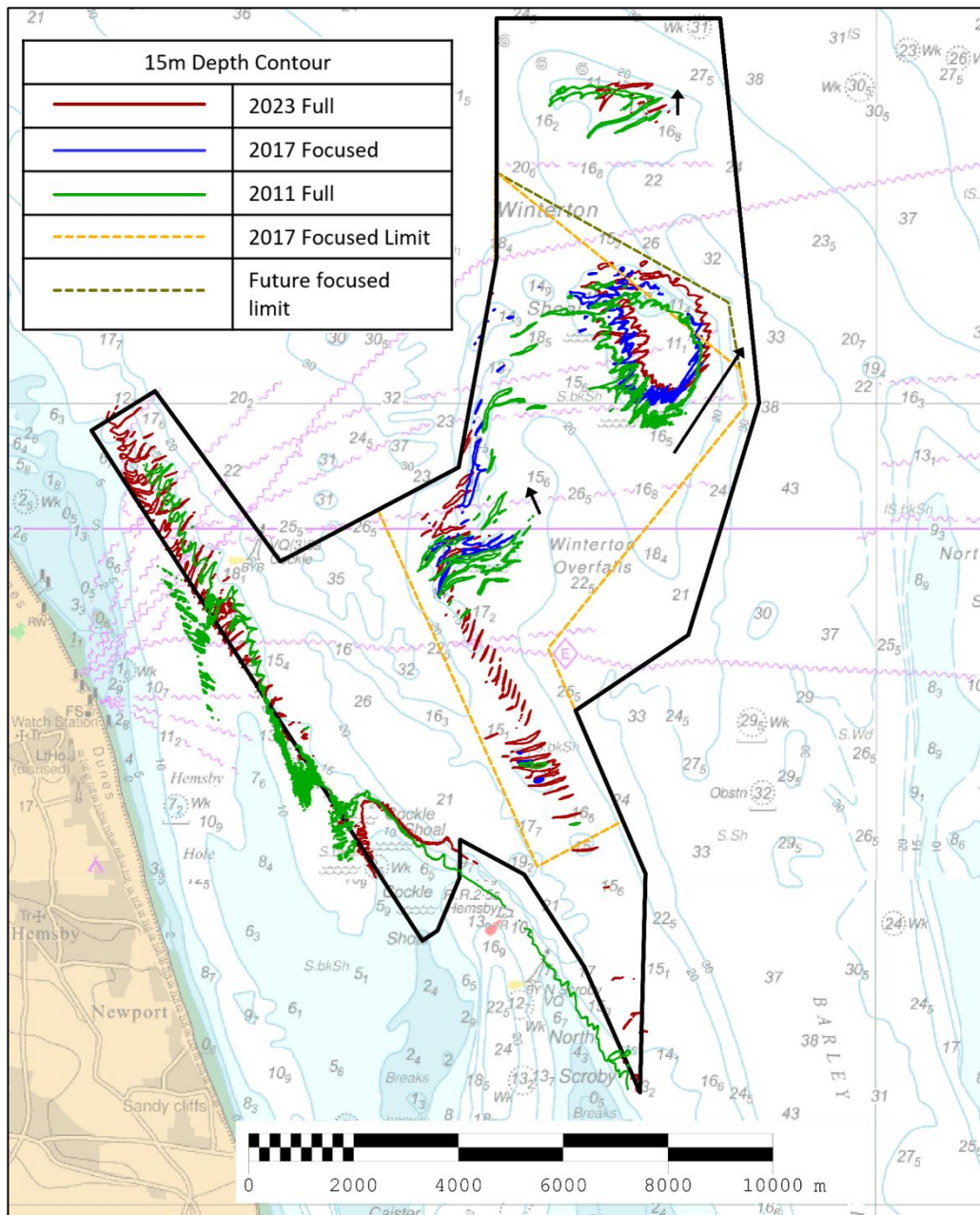


Figure 6: Contour plot showing changes in the 15m contours between 2023 (red), 2017 (blue) and 2011 (green) overlaid on BA Charts 1543 and 106. Black arrow represents feature migration. 2017 and future focused limits shown.

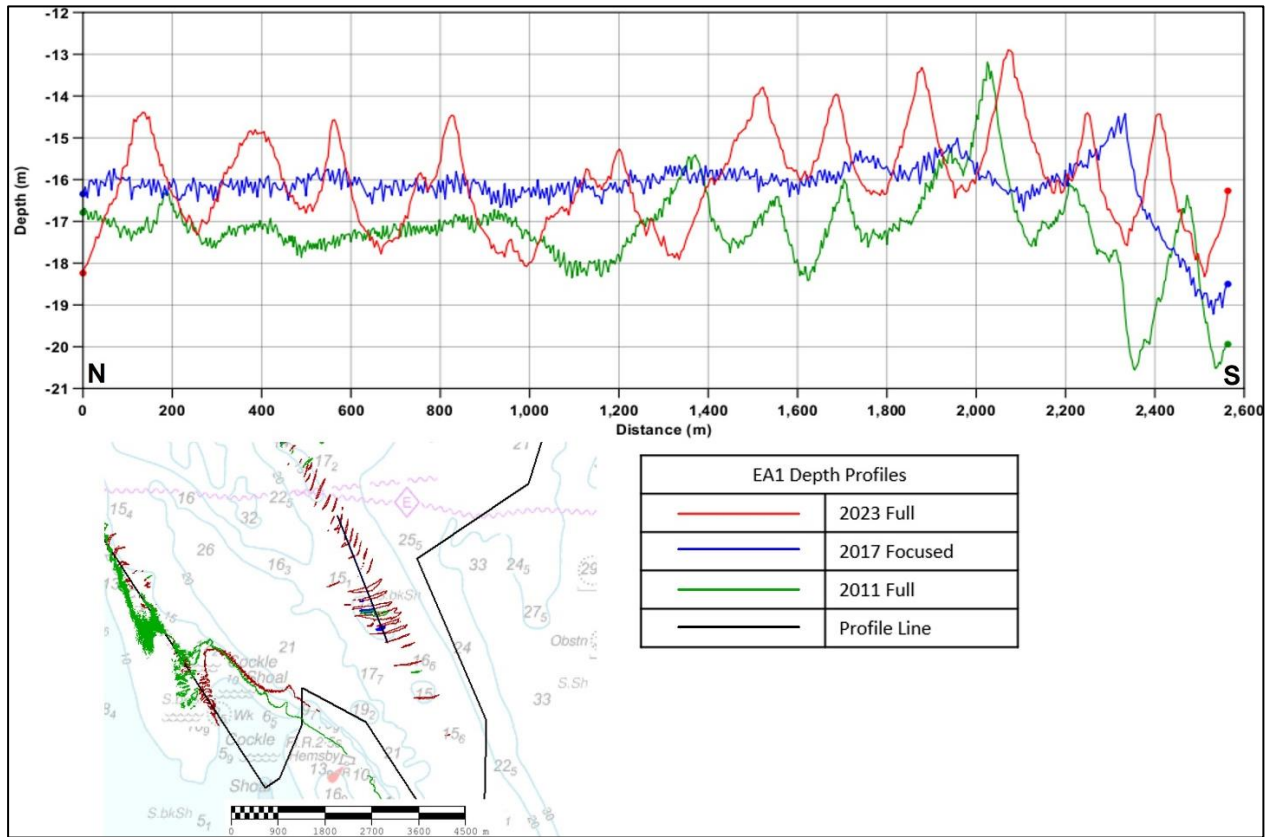


Figure 7: Depth profiles of 2011 (green), 2017 (blue) and 2023 (red) surveys. Black line EA1 area on chart insert shows profile line location.

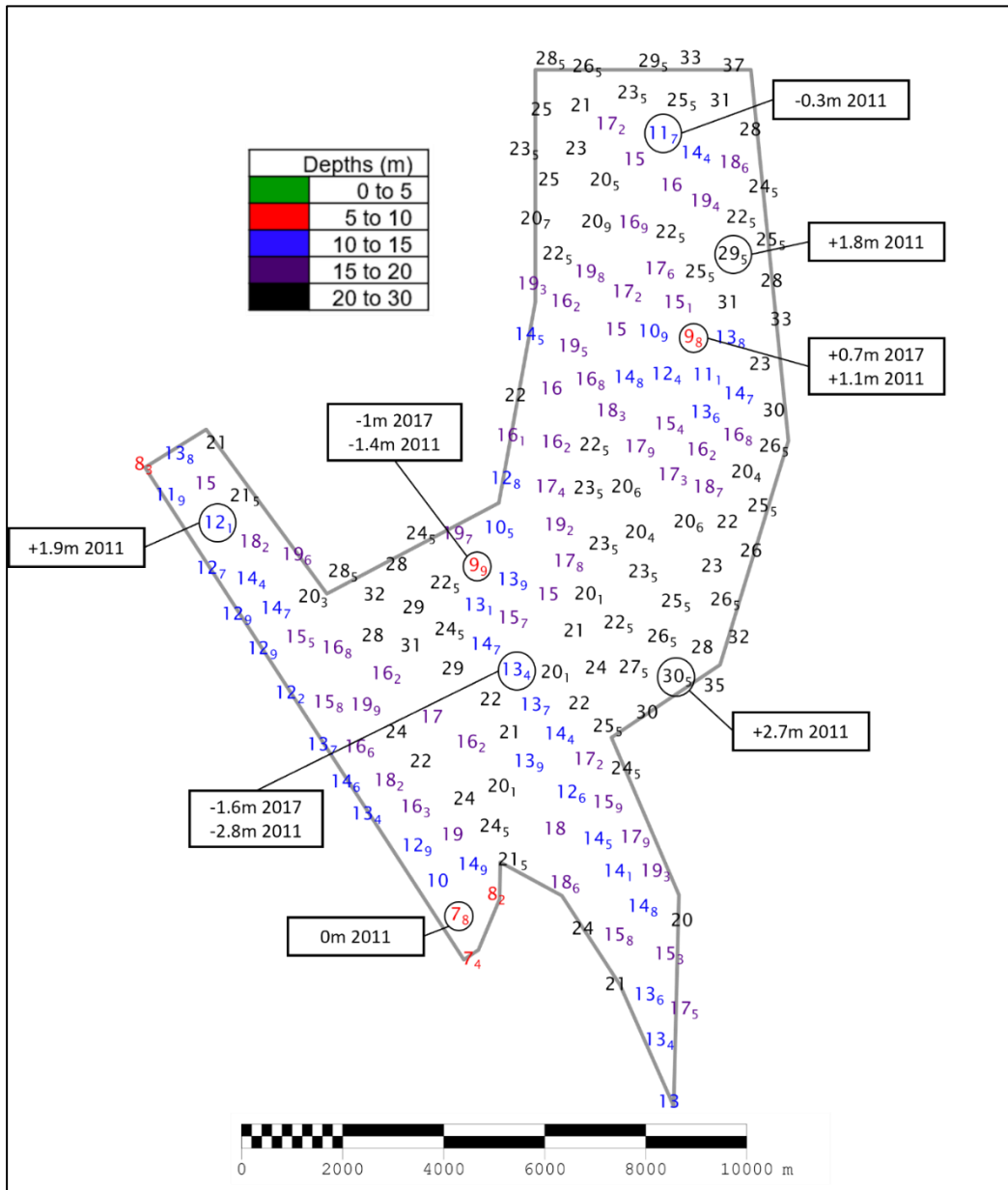


Figure 8: Colour banded depth plot from the 2023 survey with selected depth changes since the 2017 and 2011 surveys. Positive values (+) represent deepening. Negative values (-) represent shoaling.

## 6. RECOMMENDATIONS FOR FUTURE SURVEYS

### Survey Interval

6.1 Given the relatively slow movement of the sediment, but with shoal depths that remain potentially hazardous to vessels with a draught of 7m or more the current 12-year full survey interval should remain with a focused area every 6 years.

### Survey Area

6.2 The current limits for EA1, Full and Focused, are sufficient to capture the current and future seabed change and shoals. No changes to the EA1 limits are required.