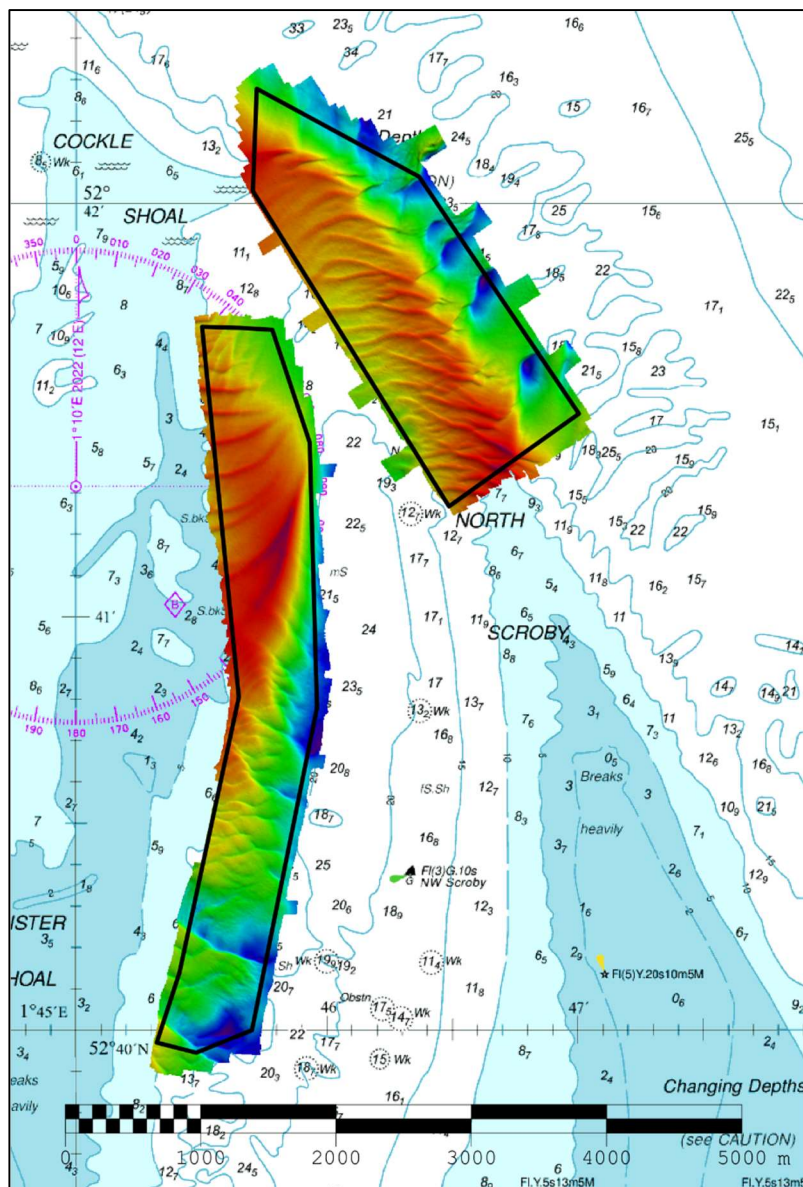




UK Hydrographic  
Office

## EAST ANGLIA EA3A & EA3B – COCKLE SHOAL FOCUSED 2022 ASSESSMENT

An assessment of the 2022 hydrographic survey of the areas EA3A and EA3B: 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 to 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 VORF Model.

## **COCKLE SHOAL (EA3A & EA3B) FOCUSED, 2022**

### **1. SUMMARY**

#### **Changes Detected**

- 1.1 The 10m and 15m contour of Caister Shoal continues to migrate eastwards, consistent with historical trends. The northern edge of EA3A has shoaled by 7.9m since 2020 due to the migration of the shoal.
- 1.2 In the southern section of EA3A there is a southwards migration of sand waves, with some areas shoaling by 7.4m and others deepening by 7.8m, since the 2021 survey.
- 1.3 The central section of EA3A, in the vicinity of the N. Caister buoy, remains relatively stable.
- 1.4 In EA3B, the 9.6m shoal patch between Hemsby buoy and N. Scroby buoy is no longer present. There is now a depth of 9.8m 150m southeast of the original shoal, next to the current 10m contour.
- 1.5 The 15m contours within area EA3B continue to move eastwards, consistent with historical trends. In the eastern section of EA3B there is a north-westerly migration of sand waves, with some areas shoaling by 12.9m and others deepening by 4.0m due to the mobility, since the 2021 survey.

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

- 1.6 Depths in the area remain potentially hazardous and changeable in sections of the survey areas and therefore require continued monitoring through annual resurveys.

#### **Recommendations**

- 1.7 Given the location of the survey areas in relation to the approaches to Great Yarmouth, and the significant changes seen within 1 year, EA3A and EA3B should remain on the annual survey interval.
- 1.8 Due to the easterly migration of Caister Shoal, the northern section of EA3A survey area should be altered to track this movement.

### **2. LOCATION**

- 2.1 Survey interval at time of resurvey: 1 year (Focused survey areas covering EA3A and EA3B). Full EA3 area is surveyed every 3 years.
- 2.2 Area Covered: 8.4 km<sup>2</sup>

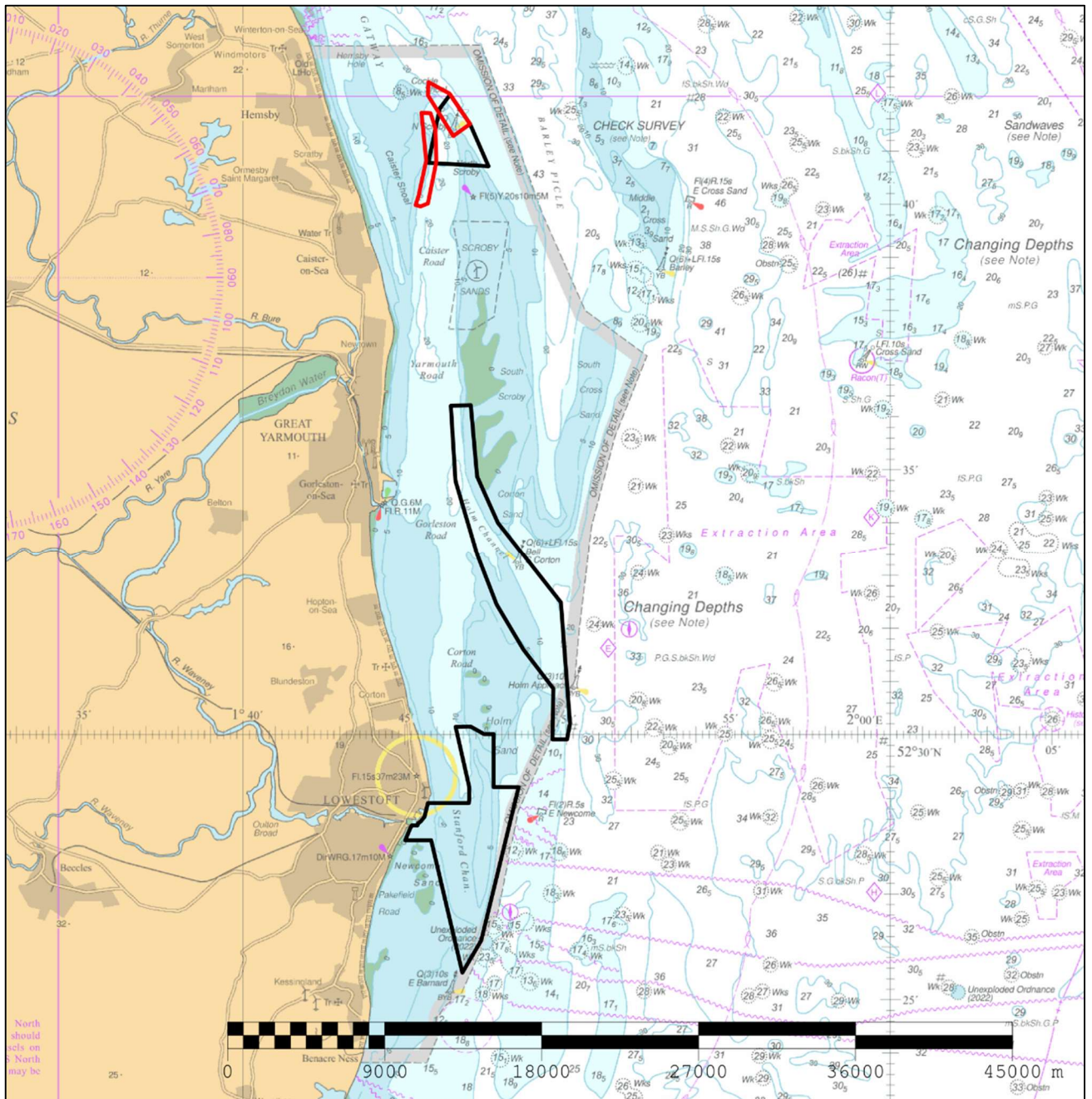


Figure 1: 2022 East Anglia Routine Resurvey areas overlaid on BA Chart 1504 with areas EA3A and EA3B in red.



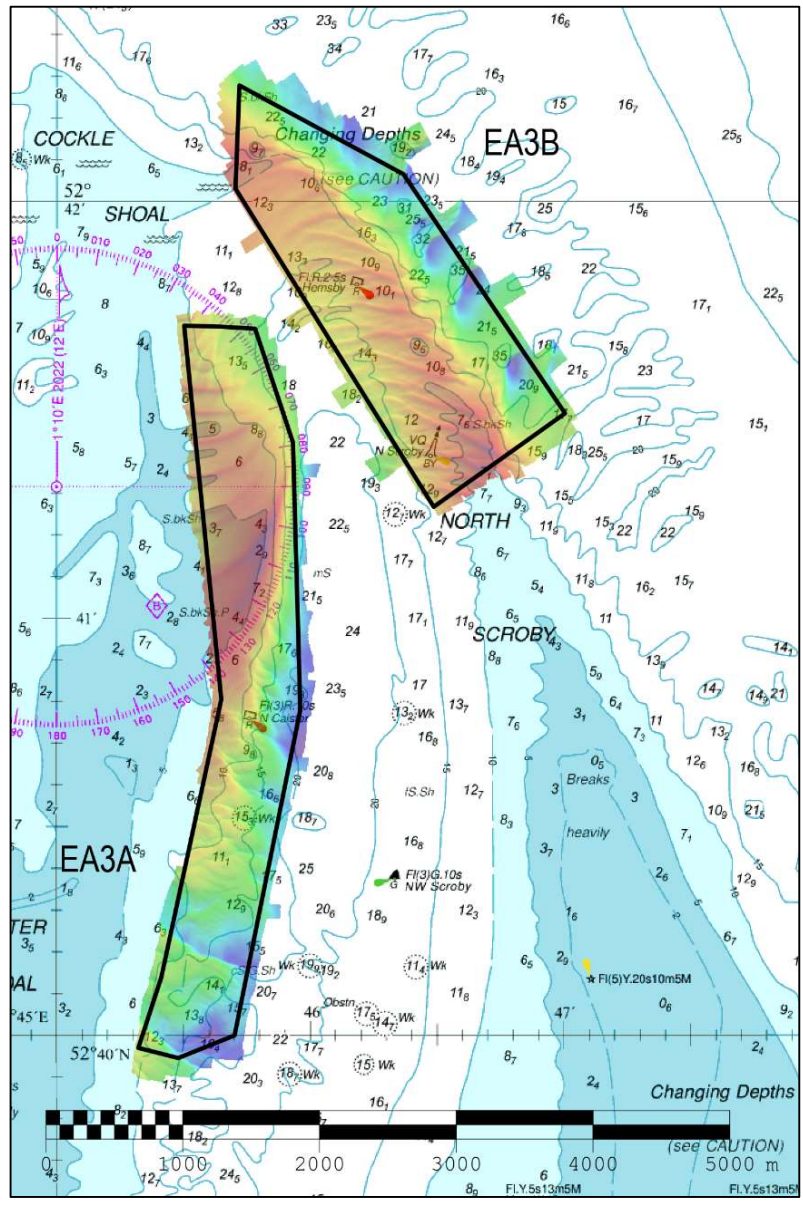


Figure 2: 2022 survey data overlaid on BA Chart 1534.

### 3. REFERENCE SURVEY DETAIL

- 3.1 The previous focused survey was conducted as part of the 2021 Routine Resurvey Programme between September and October 2021 as part of HI1736. Another full survey was conducted as part of the same programme in June 2020 as part of HI1684 and HI1685.
- 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 Focused surveys were conducted in September 2022 as part of HI1760.
- 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 Significant depths within the northern section of area EA3A indicate the continuing easterly migration of the eastern edge of Caister Shoal (see Figures 3 & 6).
- 5.2 No evidence of the charted 15.3m wreck situated within the southern section of EA3A was found within the 2022 survey. A shoal of 10.6m was found southward of the charted position of the wreck. The surrounding area is shoaling, suggesting that sand waves may be temporarily concealing the wreck (see Figure 3).
- 5.3 In area EA3B, the controlling depth of 10.6m 490m north-westwards of Hemsby buoy has deepened to 11.0m. The 9.6m shoal patch between Hemsby buoy and North Scroby is no longer present. Instead, there is a 9.8m shoal immediately north of North Scroby's 10m contour. The controlling depth of 10.1m southeast of Hemsby buoy has moved south-eastwards (see Figure 3).
- 5.4 The 10m contour of Cackle Shoal in the north of EA3B has migrated northwards (see Figure 6).
- 5.5 There is continued north-westward sand wave migration on the eastern edge of EA3B (see Figures 4 & 5).

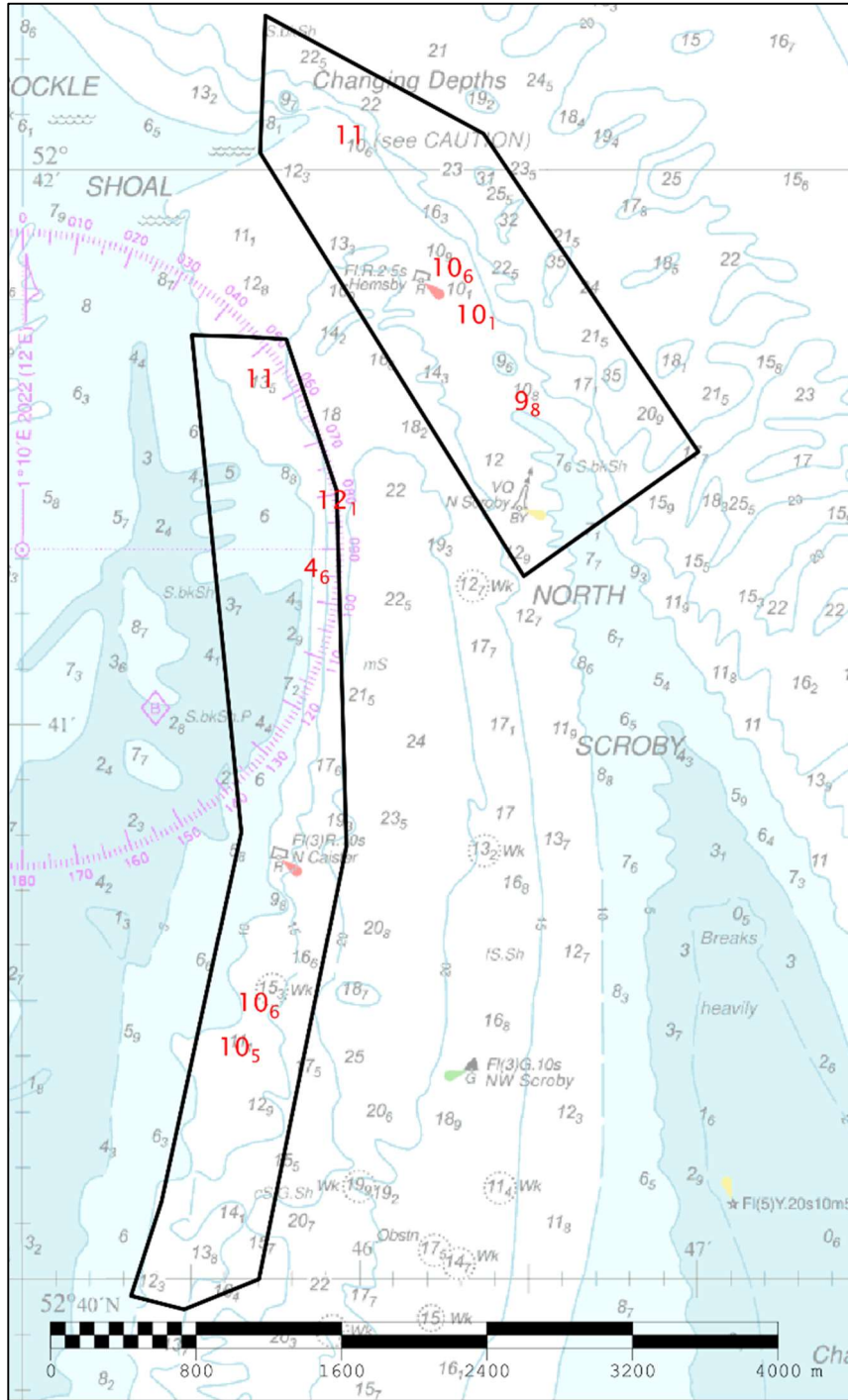


Figure 3: Controlling and significant depth soundings highlighted, overlaid on BA chart 1534.

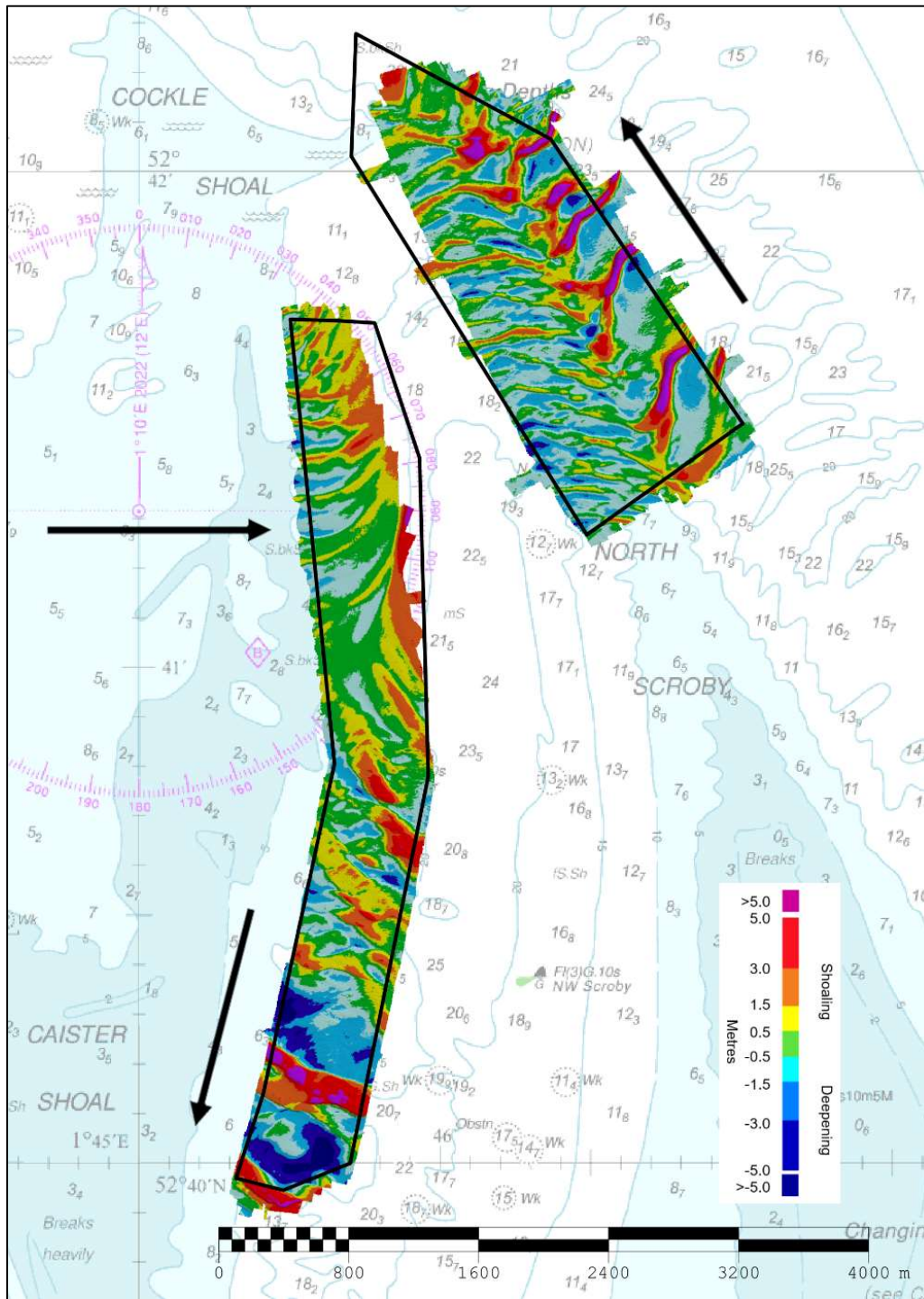


Figure 4: Difference surface showing bathymetric changes between the 2022 and 2021 surveys overlaid on BA Chart 1534 (Black arrows represent sand wave migration since 2021 survey).



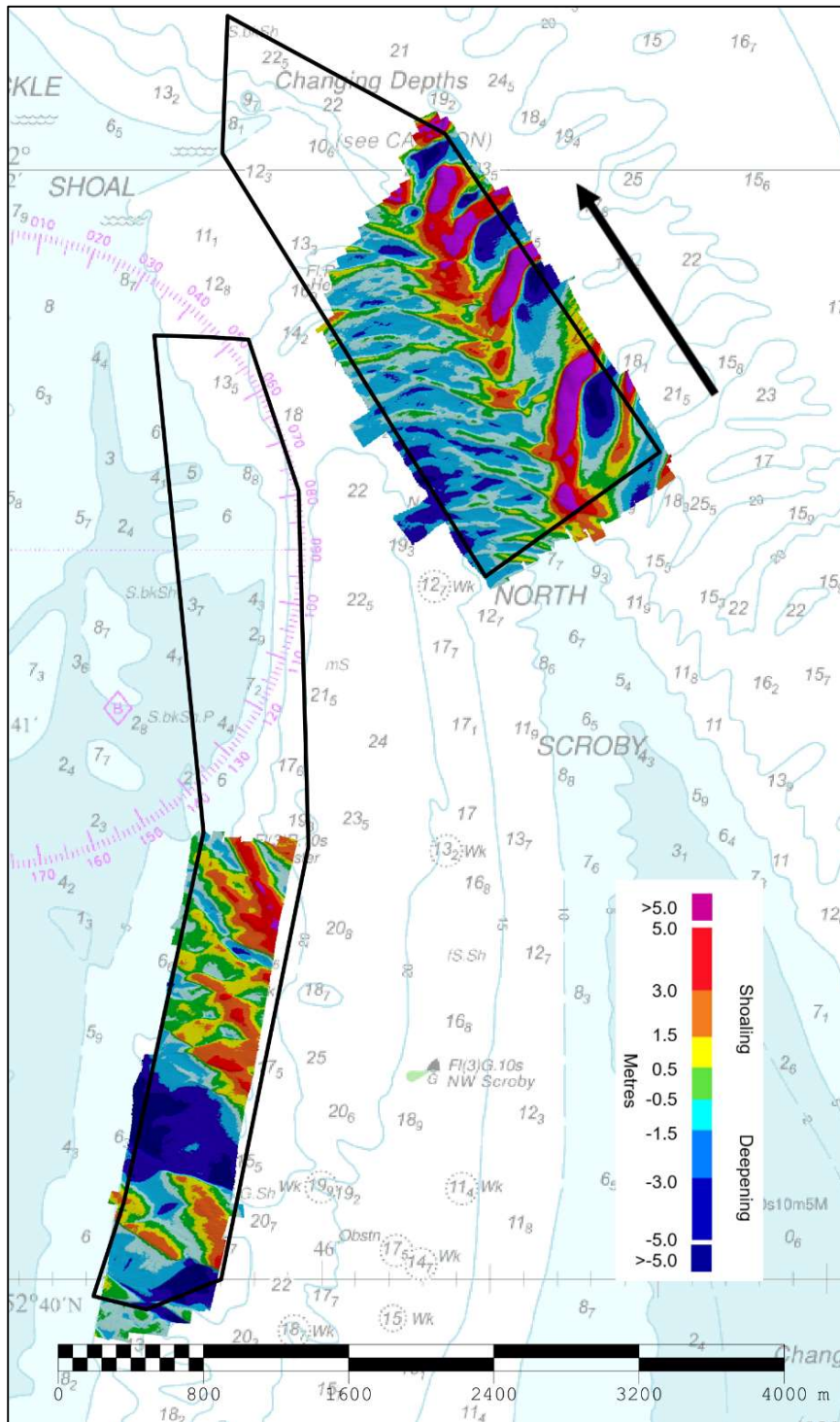


Figure 5: Difference surface showing bathymetric changes between the 2022 and 2020 surveys overlaid on BA Chart 1534 (Black arrows represent sand wave migration since 2020 survey).

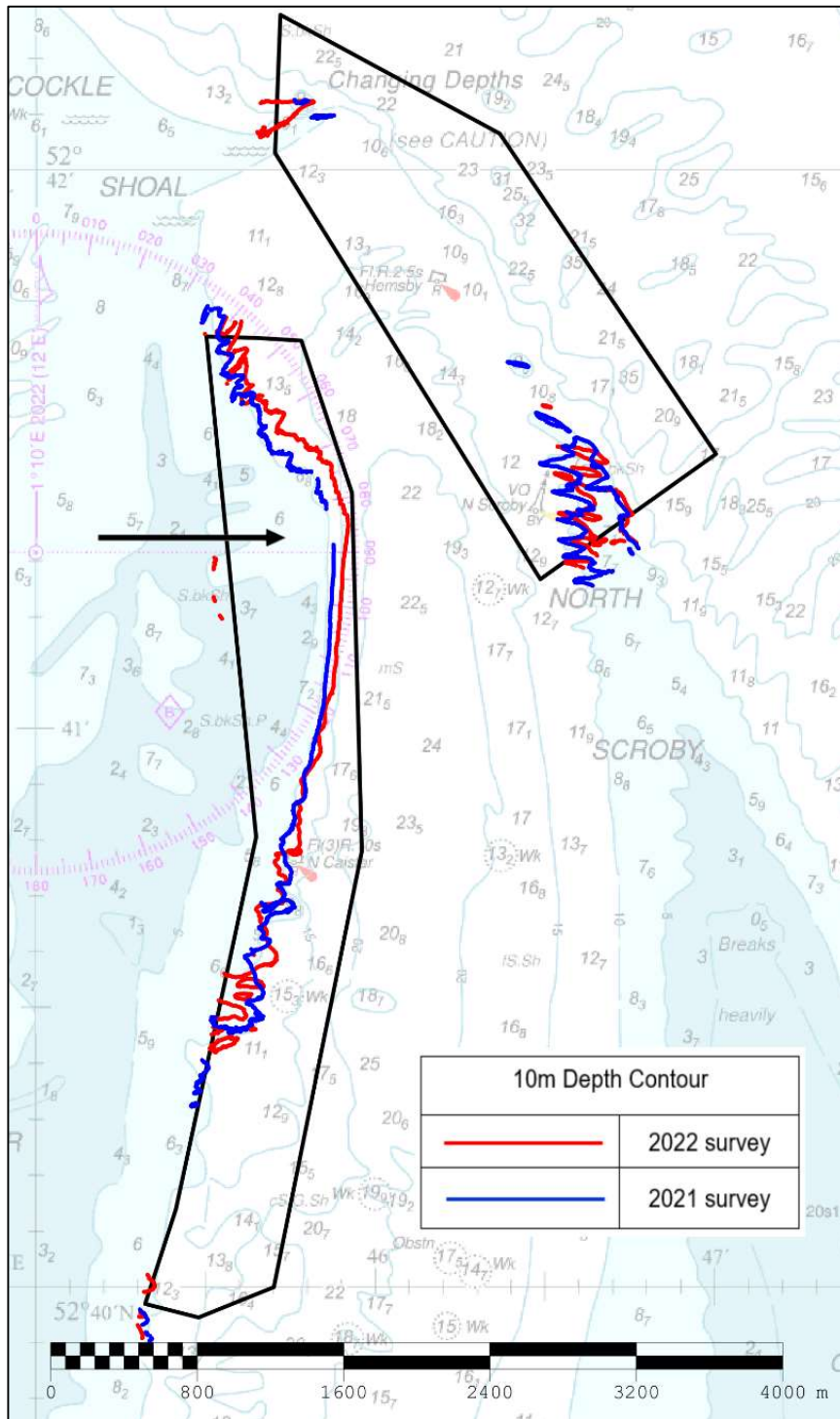


Figure 6: Contour plot showing changes in the 10m contour between 2022 (red) and 2021 (black). Black arrow represents feature migration.

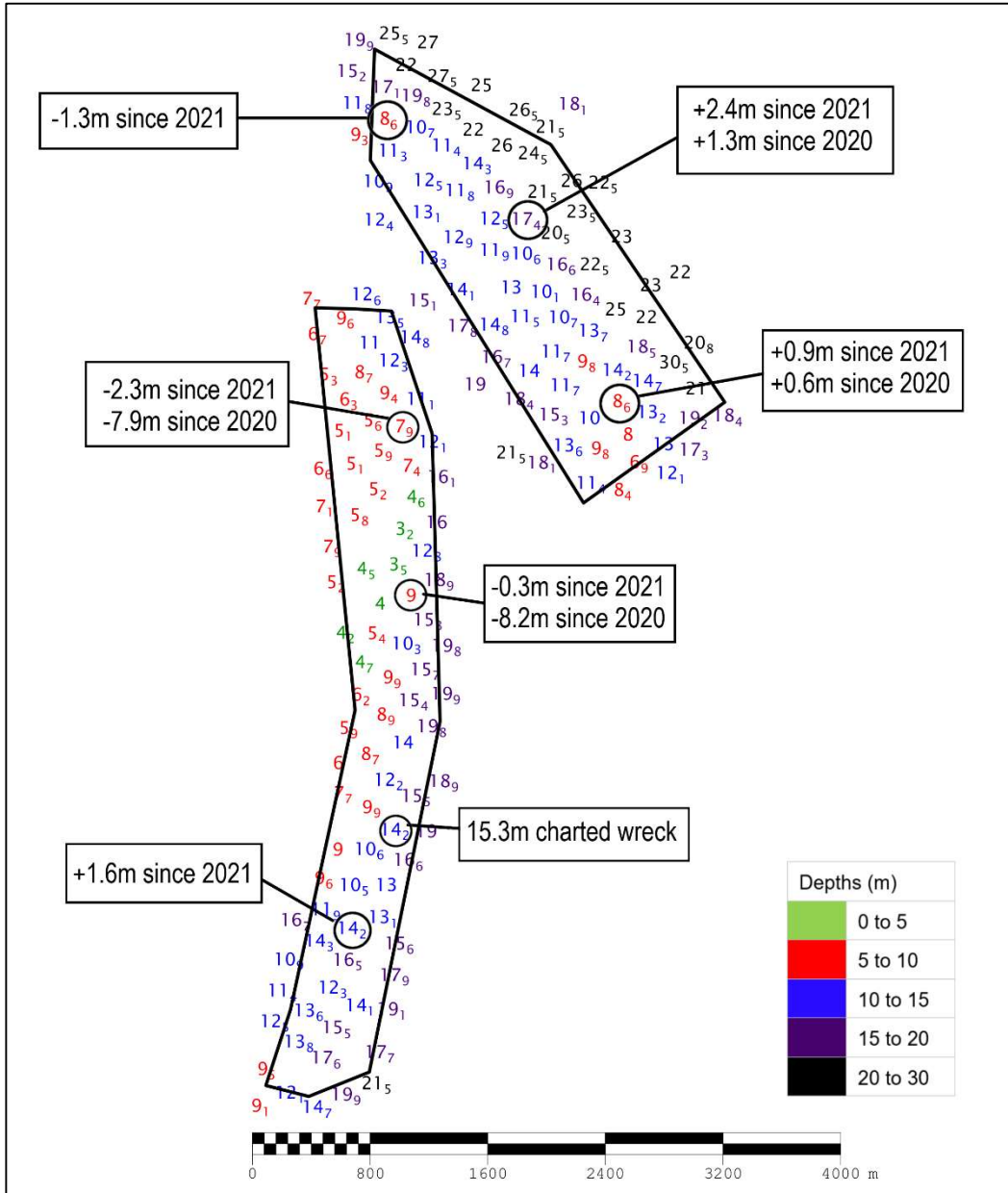


Figure 7: Colour banded depth plot from the 2022 survey with selected depth changes since the 2021 and 2020 survey. Positive values (+) represent deepening. Negative values (-) represent shoaling.

## 6. RECOMMENDATIONS FOR FUTURE SURVEYS

### Survey Interval

6.1 Due to the mobile nature of the area, the annual focused surveys should be maintained, with the full EA3 survey being completed every 3<sup>rd</sup> year.

## Survey Area – Focused

6.2 Due to the continued shoaling and movement of Caister Shoal eastwards towards Caister Road, the focused area EA3A should be adjusted in the northern section to follow this movement and monitor its impact upon Caister Road. Revised limits (with coordinates listed) are shown in Figure 8 below:

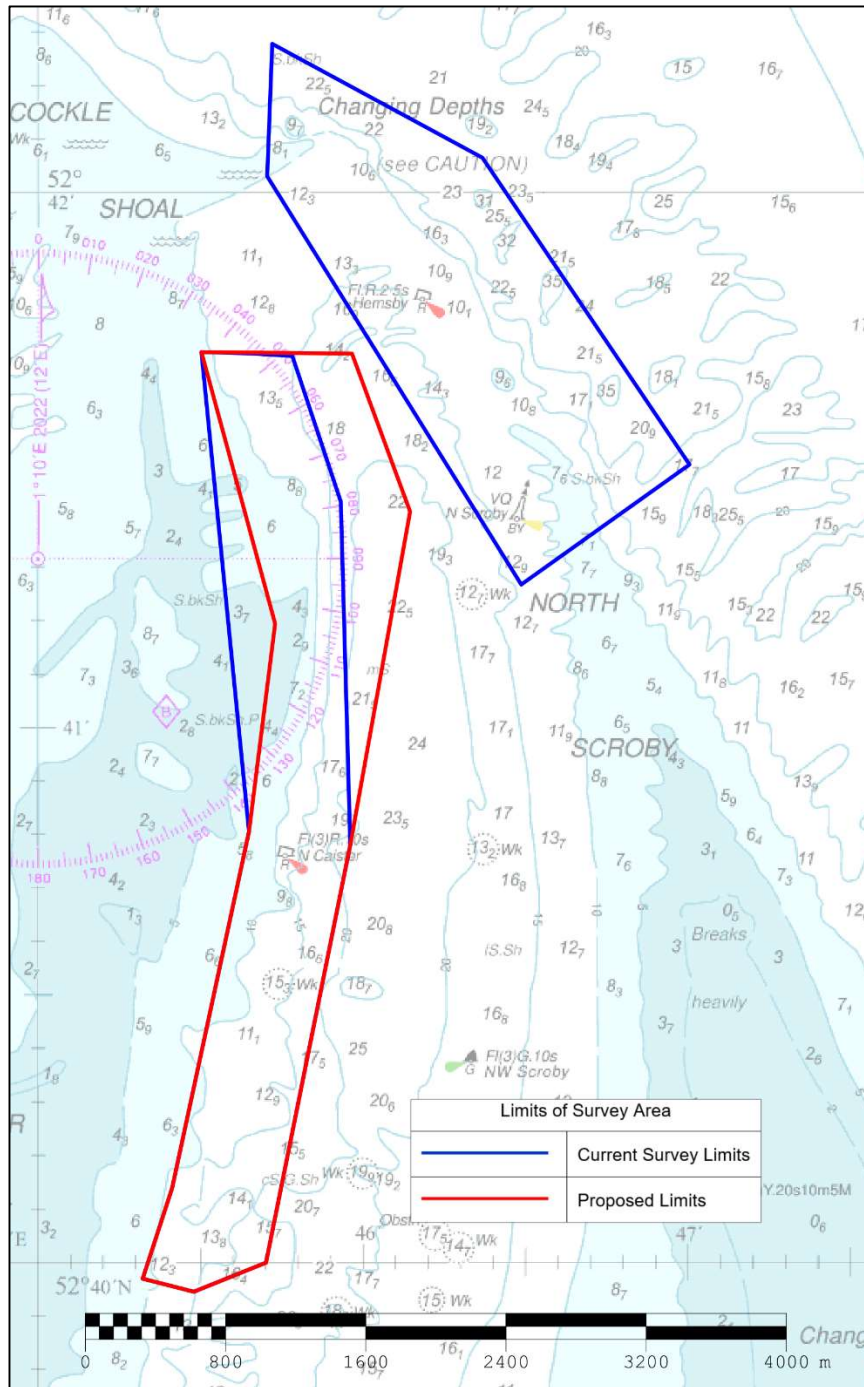


Figure 8: Recommended changes to survey limits of focussed survey area EA3A (current limits for the focused area in blue with proposed adjustment in red)



*Proposed coordinates for survey limits of focussed survey area EA3A*

	<b>Latitude</b>	<b>Longitude</b>
1	52-41.699724N	001-45.963804E
2	52-41.404410N	001-46.142538E
3	52-40.781070N	001-45.958524E
4	52-39.999906N	001-45.699306E
5	52-39.945564N	001-45.477408E
6	52-39.969900N	001-45.320058E
7	52-40.139442N	001-45.410604E
8	52-40.806126N	001-45.647070E
9	52-41.194752N	001-45.727440E
10	52-41.702580N	001-45.500676E

**Survey Area – Full**

- 6.3 To allow for an annual comparison of the movement of shoals, the EA3 Full survey area limits should also be updated to reflect the changes in the focused survey areas. Revised limits (with coordinates listed) are shown in Figure 9 below:

*Proposed coordinates for survey limits of full survey area EA3*

	<b>Latitude</b>	<b>Longitude</b>
1	52-42.065916N	001-46.364790E
2	52-41.492286N	001-47.001954E
3	52-40.699902N	001-47.572392E
4	52-40.781070N	001-45.958524E
5	52-39.999906N	001-45.699306E
6	52-39.945564N	001-45.477408E
7	52-39.969900N	001-45.320058E
8	52-40.139442N	001-45.410604E
9	52-40.806126N	001-45.647070E
10	52-41.194752N	001-45.727440E
11	52-41.702580N	001-45.500676E
12	52-42.031134N	001-45.703020E
13	52-42.278586N	001-45.718506E

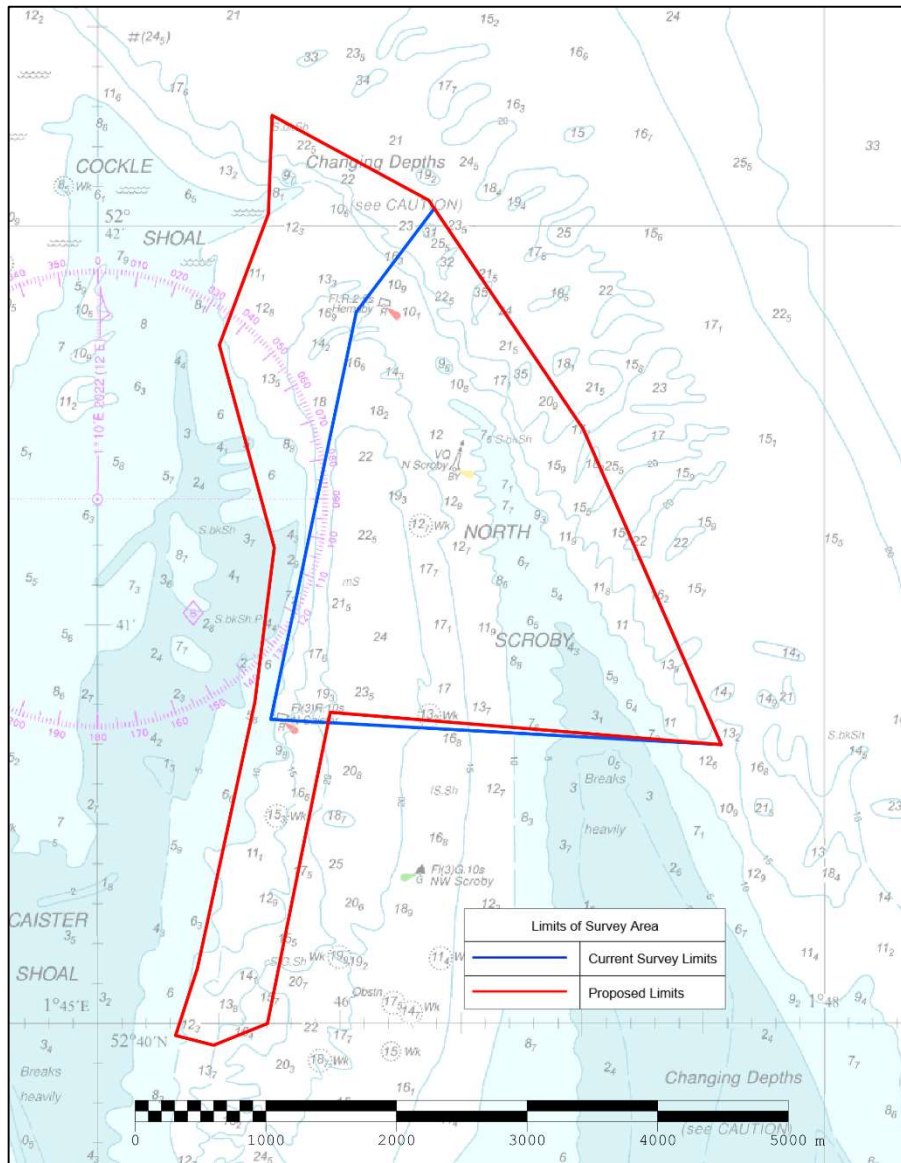


Figure 9: Recommended changes to survey limits of full survey area EA3 (current limits for the full area in blue with proposed adjustment in red)