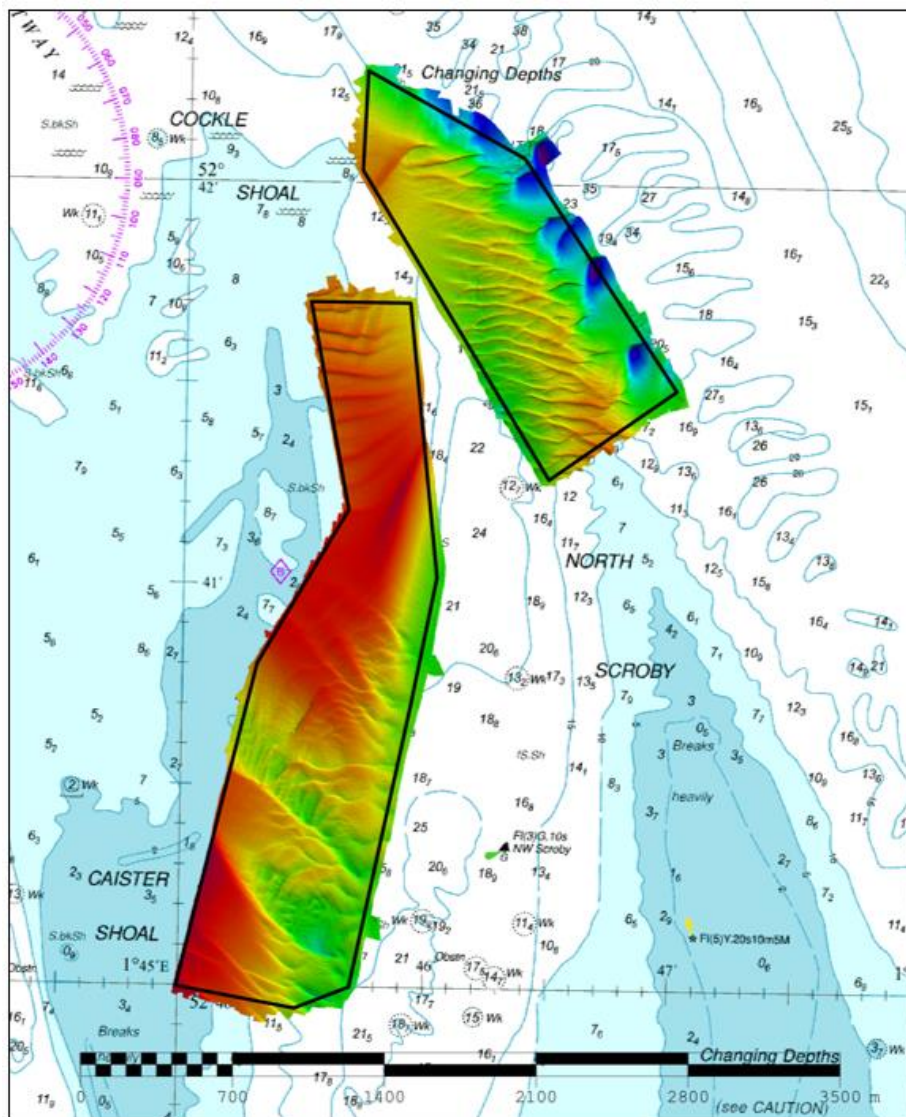




UK Hydrographic
Office

EAST ANGLIA EA3A & EA3B – COCKLE SHOAL FOCUSED 2024 ASSESSMENT

An assessment of the 2024 hydrographic survey of the area 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 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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All depths are to Chart Datum, defined using the UKHO Vertical Offshore Reference Frame (VORF) Model.

COCKLE SHOAL (EA3A & EA3B) FOCUSED, 2024

1. SUMMARY

Changes Detected

- 1.1 In EA3A, Caister Shoal continues to migrate northeast pushing the 10m contour towards North Scroby. A depth of 5.9m has been observed on the northeastern extent of Caister Shoal, shoaling by 5.1m since 2023.
- 1.2 In EA3B, there is evidence that Cockle Shoal is slowly migrating southeast towards North Scroby. A shoal depth of 8.4m has been observed here, shoaling by 3.2m since 2023.
- 1.3 In the southern part of EA3A, sandwave migration has moved northwards. An area of deeper depths has been observed to the south and west of the N. Caister Buoy.
- 1.4 The central section of EA3A, north of the N.Caister buoy, is showing a northeasterly migration of sandwaves.
- 1.5 The southern section of EA3B, in the vicinity of the N.Scroby buoy, is slowly migrating further southeast, a shoal depth of 9m has been observed, shoaling by 1.3m since 2023.
- 1.6 The central section of EA3B, northwest of the N.Scroby buoy, a controlling depth of 10.9m has been observed, shoaling by -1.7m since 2023.

Reasons for Continuing to Resurvey the Area

- 1.7 Depths in the area remain changeable and a potential hazard to vessels navigating the area, therefore, requiring continued monitoring through annual resurveys.

Recommendations

- 1.8 Given the location of the survey in relation to the approaches to Great Yarmouth, and the continued migration of Caister Shoal, Cockle Shoal and North Scroby bank, EA3A and EA3B should remain on the annual survey interval. The EA3 Full survey should remain on the 3-year interval.
- 1.9 Due to the north easterly migration of Caister Shoal, the northeastern section of EA3A survey area should be adjusted to capture this movement.

2. LOCATION

- 2.1 Survey interval at time of resurvey: 1 year (Focused survey areas EA3A and EA3B). Full EA3 area is surveyed every 3 years.
- 2.2 Area Covered: 3.2 km²

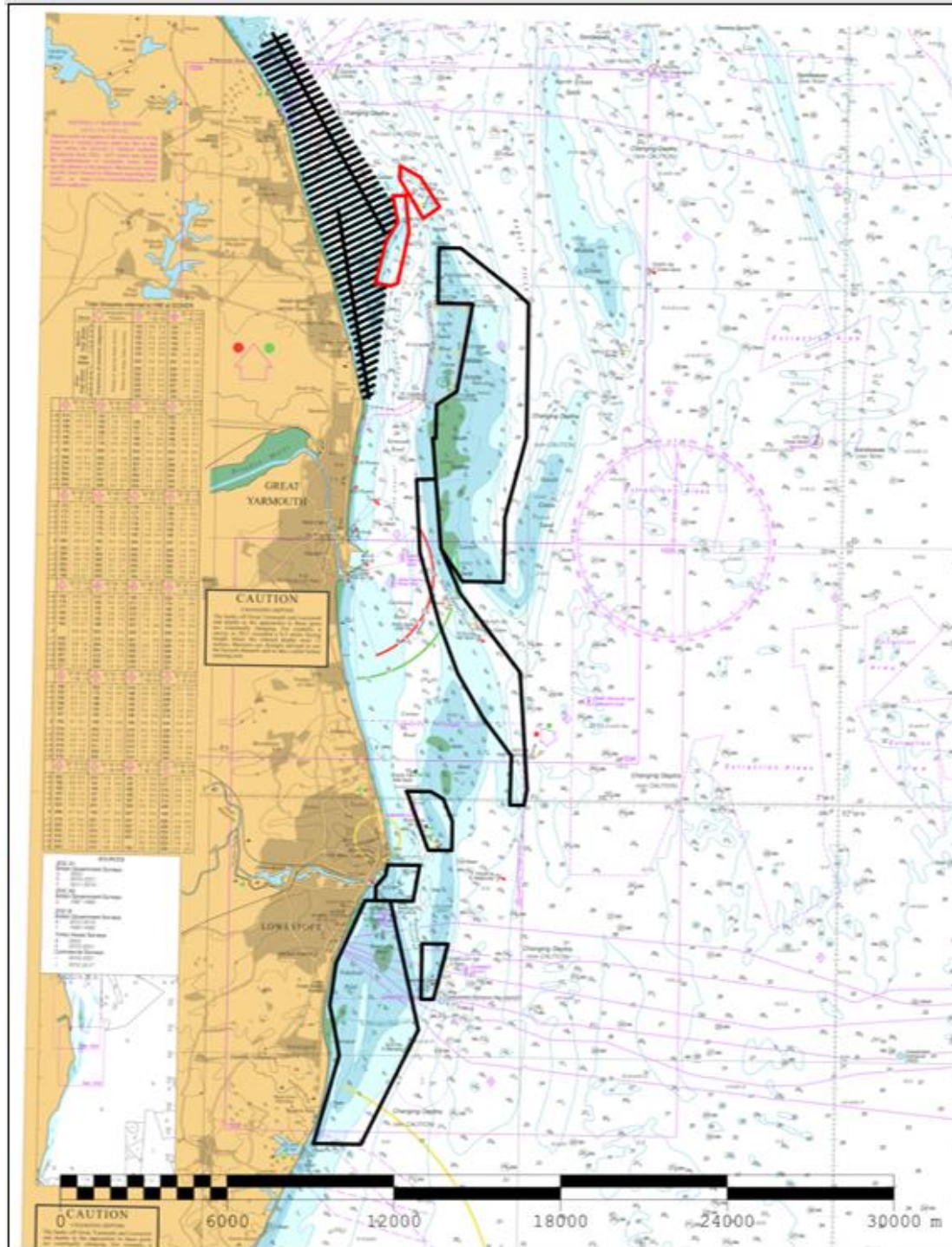


Figure 1: 2024 East Anglia Routine Resurvey areas overlaid on BA Chart 1543 with areas EA3A and EA3B in red.

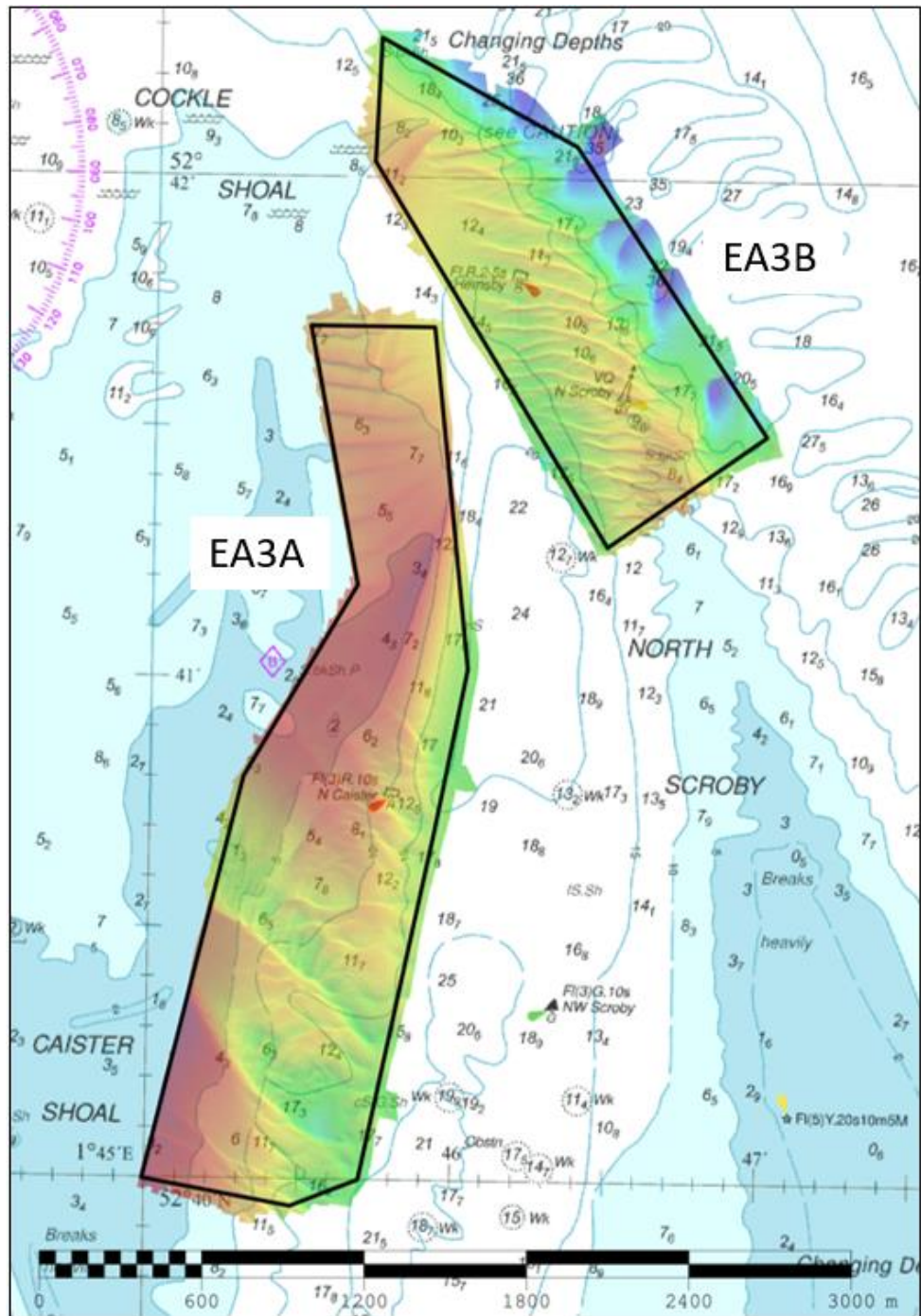


Figure 2: 2024 survey data overlaid on BA Chart 1534.

3. REFERENCE SURVEY DETAIL

- 3.1 In 2022 another focused survey (HI1760), was completed, covering EA3A and EA3B as part of the 2022 Routine Resurvey Programme. The previous full survey, EA3 Full (HI1823), was conducted was surveyed in October 2023 as part of the 2023 Routine Resurvey Programme.
- 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 2024 (HI1855) as part of in the 2024 Routine Resurvey Programme.
- 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 Caister Shoal shows significant depth changes within the northern section of EA3A, caused by easterly sand wave migration. Figure 3 shows a significant depth of 5.9m in 2024, located on the northeastern edge of EA3A. This depth has shoaled by 5.1m since 2023 and 9.6m since 2022.
- 5.2 The Caister Shoal 10m contour (Figure 6 & 7) shows significant migration on the northeastern edge of area EA3A. The 10m contour, as seen in Figure 7, has migrated eastwards by approximately 50m since 2023, however, the full extent of the 10m contour is not determined due to the survey extents not being adequate to display the change. Figure 6 shows a buoy line (thin blue line) between Hemsby buoy and N.Caister Buoy that shows the 2024 10m contour moving through from the west.
- 5.3 In the middle section of EA3A, Figures 4 & 6 show a northerly migration of sand waves. The 10m contour has moved northwards by approximately 200m since 2023. Within the same area of EA3A, Figure 6 shows no significant change to the 10m contour limit moving eastwards. Also seen in Figure 6 is a gap opening in the 10m contours to the west of the area. This deepening could potentially indicate the opening of a channel within Caister Shoal; however this area does shoal to <10m in the adjacent survey HI1859 (area EA11 Hemsby Hole checklines).
- 5.4 In EA3B, the shoalest depth of the 2024 survey can be found on the eastern extent of Cockle Shoal at 8.4m, see Figure 3. This is 3.2m shoaler than the same location in 2023. The shoal depth in 2023 was 8.2m, found 150m to the north of the 2024 least depth.
- 5.5 In the area of EA3B, Figure 6 shows the 10m contour limits migrate towards the southeast at both areas of Cockle Shoal and N. Scroby. Figure's 4 & 5 show sand wave migration slowly moving in a southeastern direction, reducing the average depths within EA3B.
- 5.6 The middle section of EA3B, Figure 3, shows there is a controlling depth of 10.9m. An observed shoaling in the same location by 1.7m since 2023 and 1.5m since 2022. A controlling depth in 2023 was 10.5m, found approximately 20m northeast of the 2024 controlling depth.
- 5.7 The shoal patch in EA3B is no longer present. As seen in Figure 6 the shoal was previously located in 2023, approximately 90m southeast of N. Scroby buoy. Figure 3 shows the significant depth of 9m, found in 2024, approximately 130m southeast of the 2023 shoal depth. This depth has a difference of 1.3m since 2023 and 0.6m since 2022.

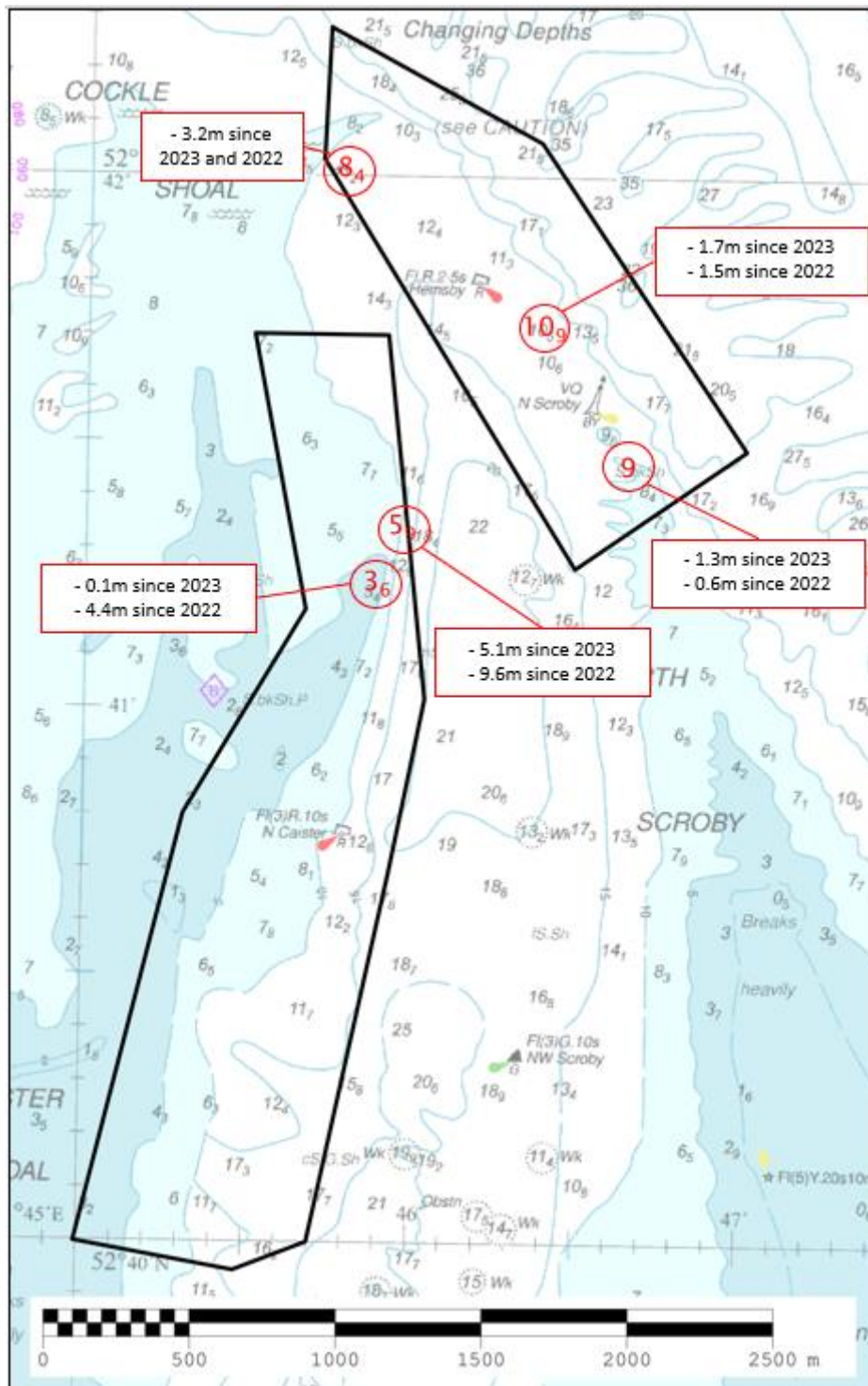


Figure 3: Controlling Depth soundings highlighted, overlaid on BA Chart 1534.

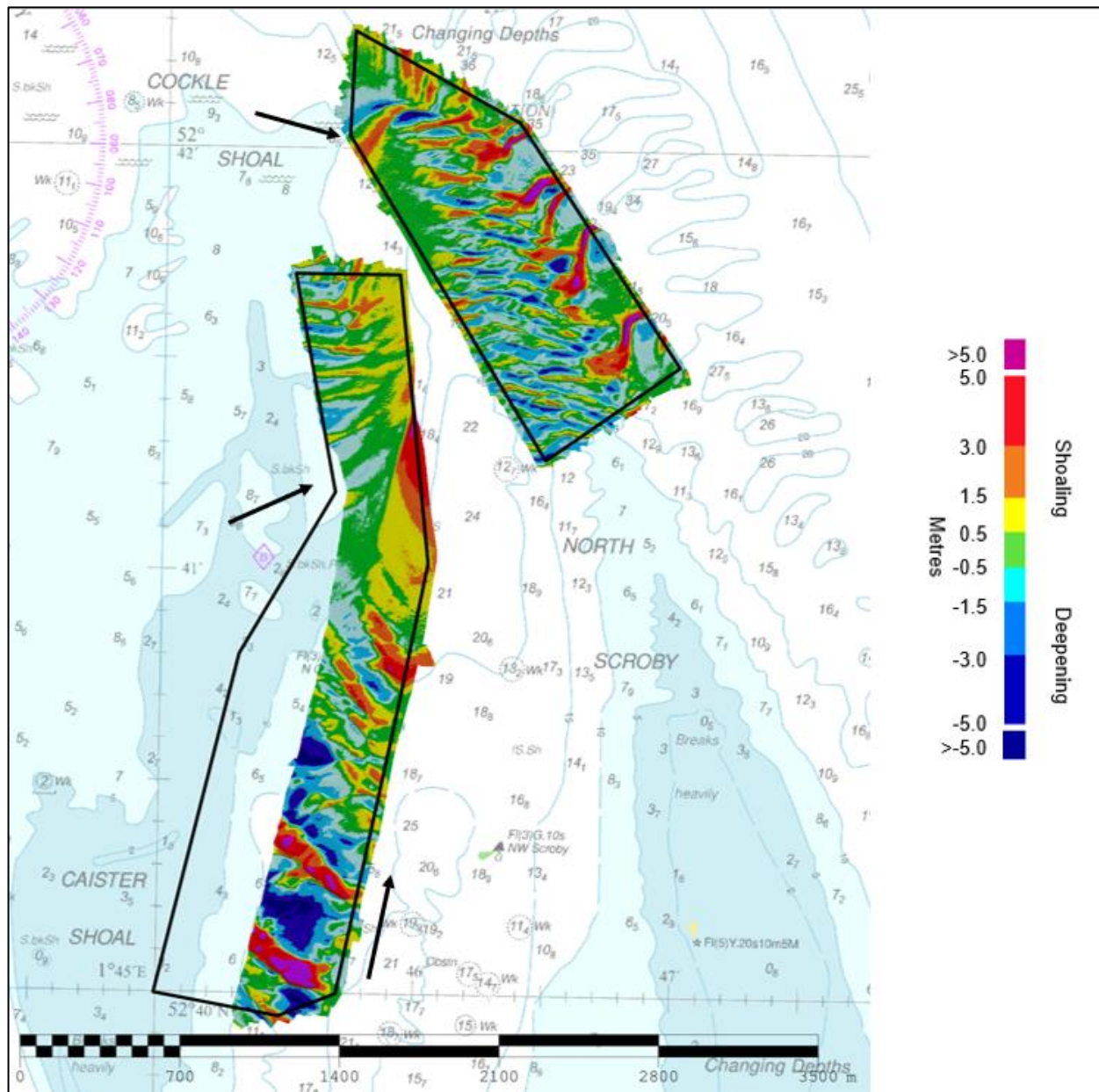


Figure 4: Difference surface showing bathymetric changes between the 2024 and 2023 surveys overlaid on BA Chart 1534 (Black arrows represent sandwave migration since 2023 survey)

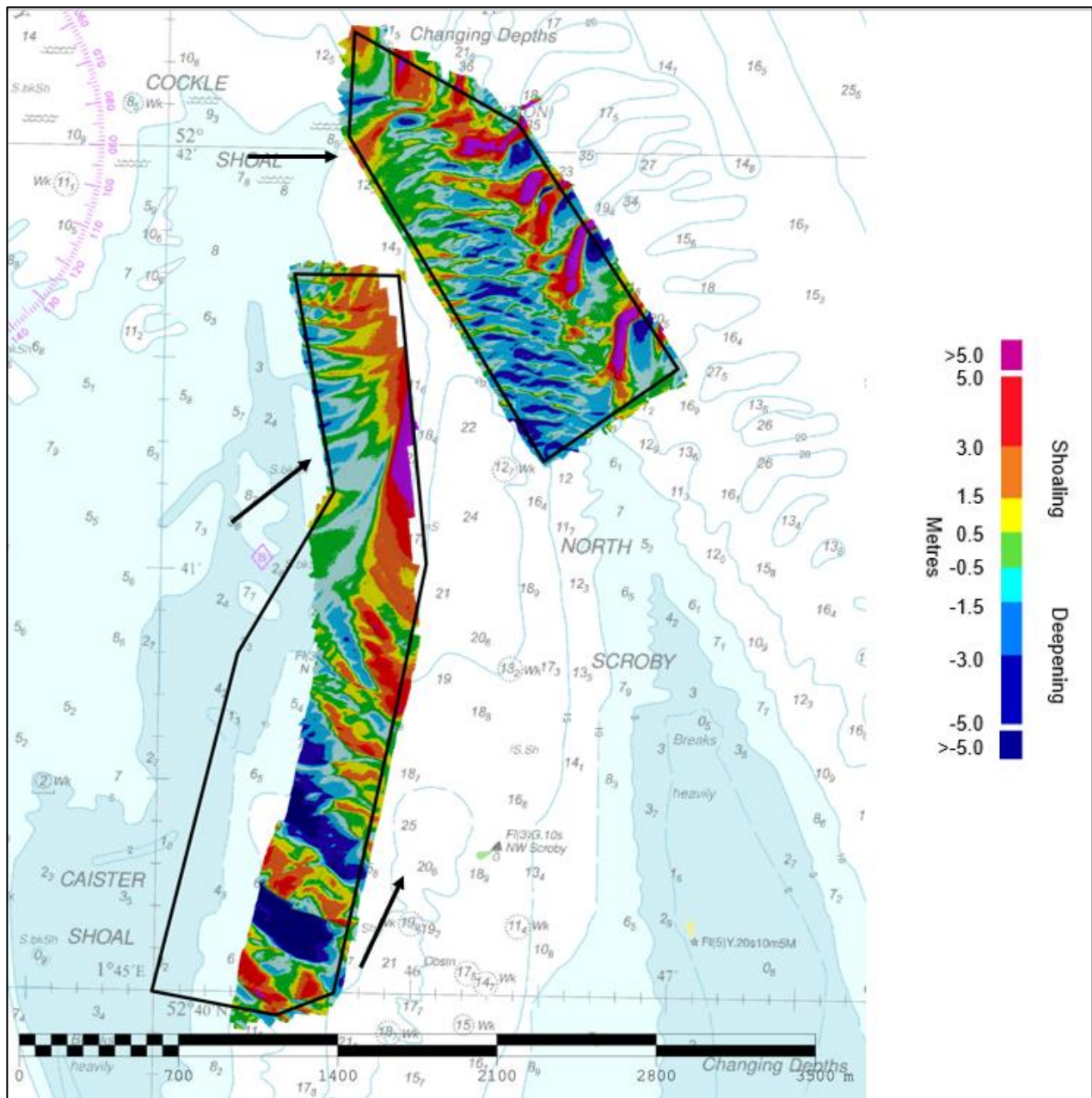


Figure 5: Difference surface showing bathymetric changes between the 2024 and 2022 surveys overlaid on BA Chart 1534 (Black arrows represent sandwave migration since 2022 survey)

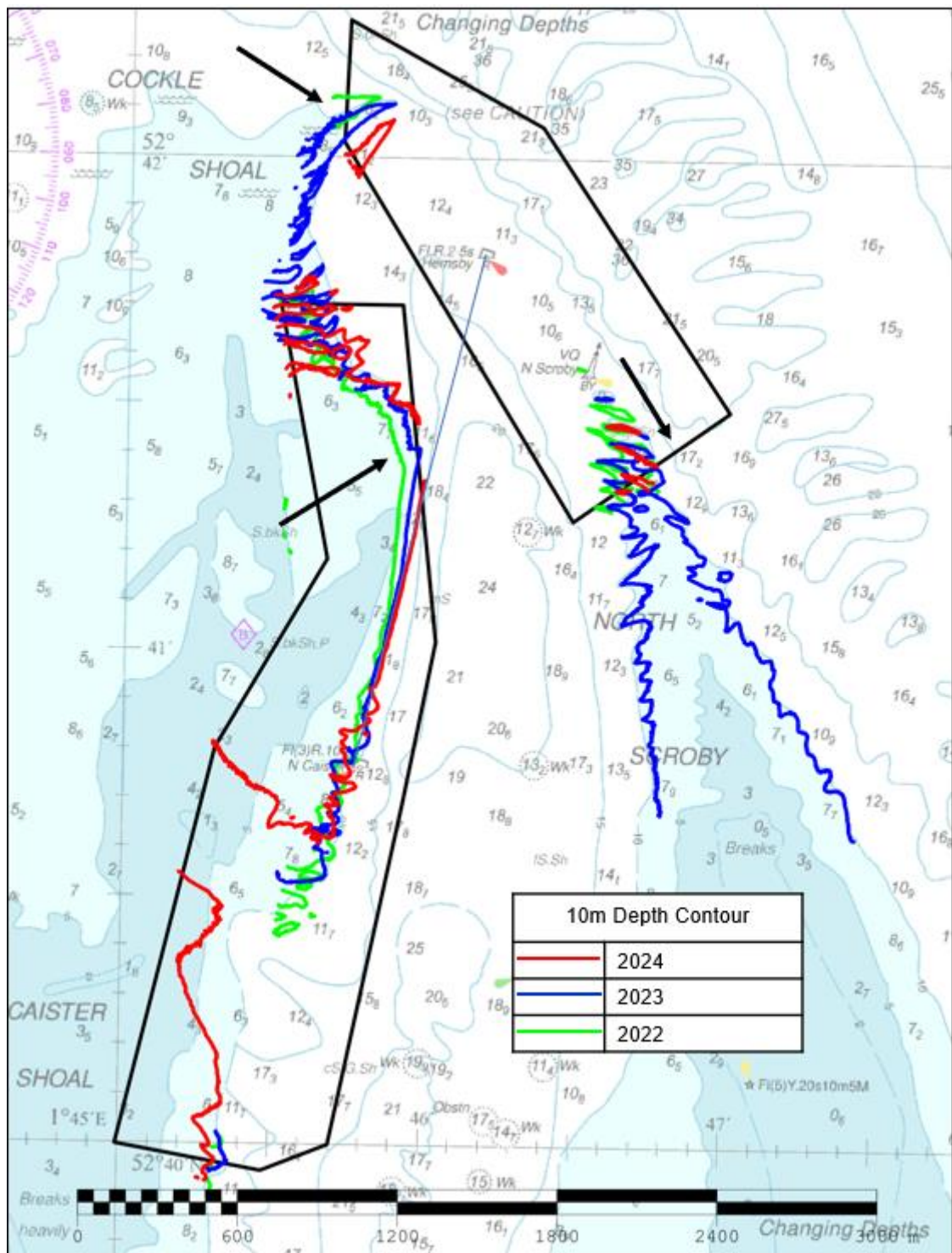


Figure 6: Contour plot showing changes in the 10m contours between 2024 (red), 2023 (Blue) and 2022 (Green). Black arrow represents feature migration.

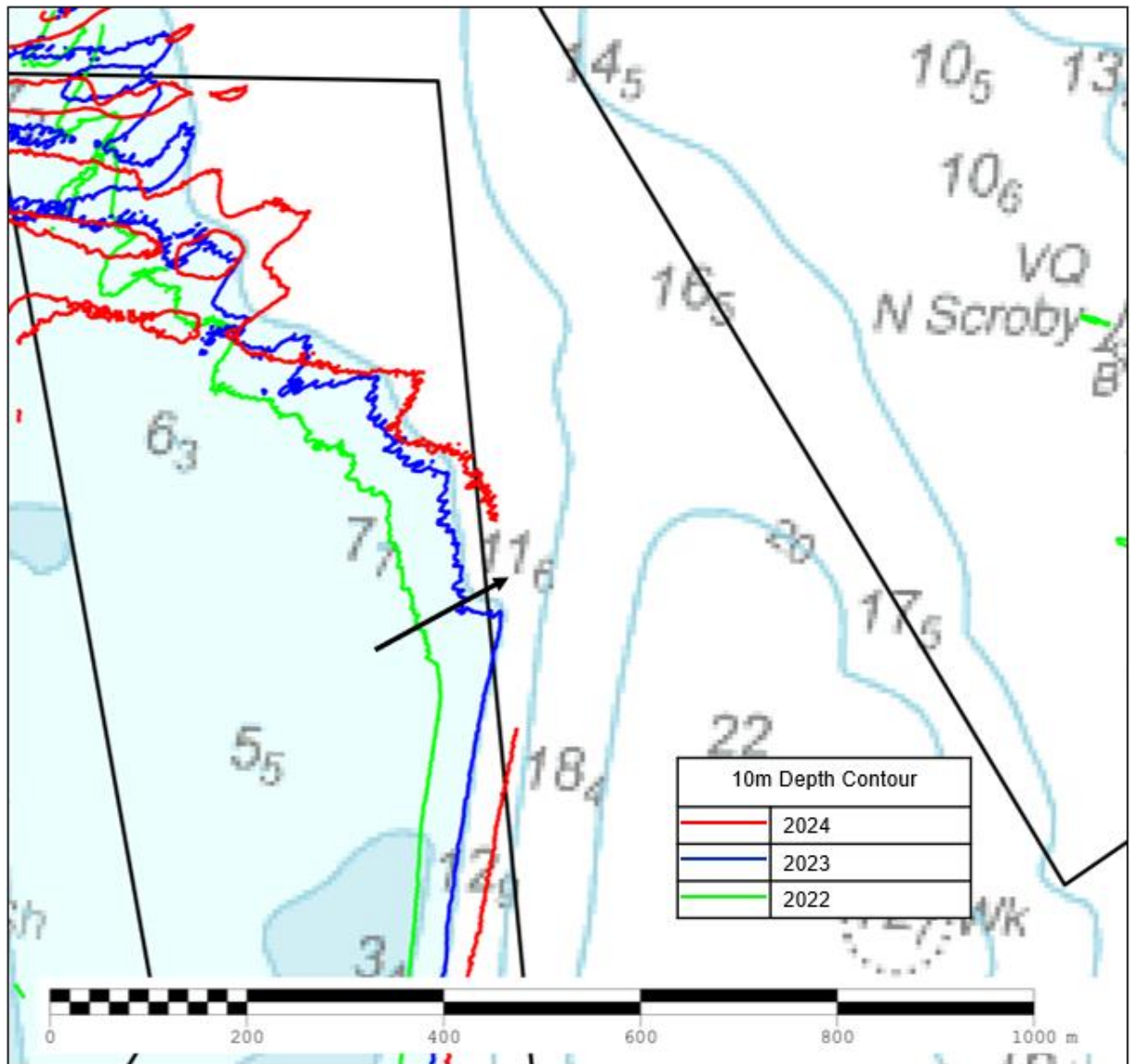


Figure 7: Contour plot showing changes in the 10m contours in EA3A between 2024 (red), 2023 (Blue) and 2022 (Green). Black arrow represents feature migration.

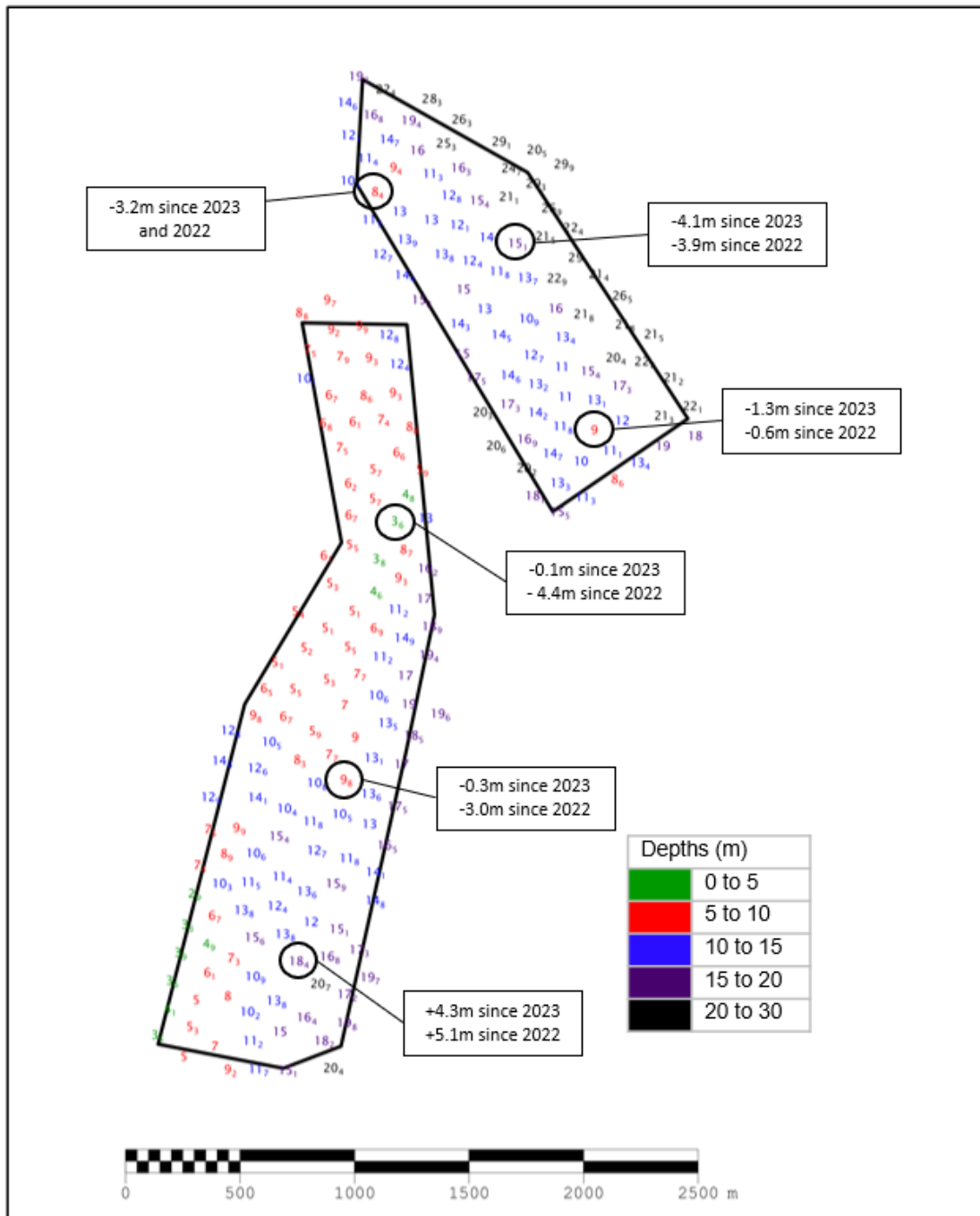


Figure 8: Colour banded depth plot from the 2024 survey with selected depth changes since the 2023 and 2022 survey. Positive values (+) represent deepening. Negative values (-) represent shoaling.

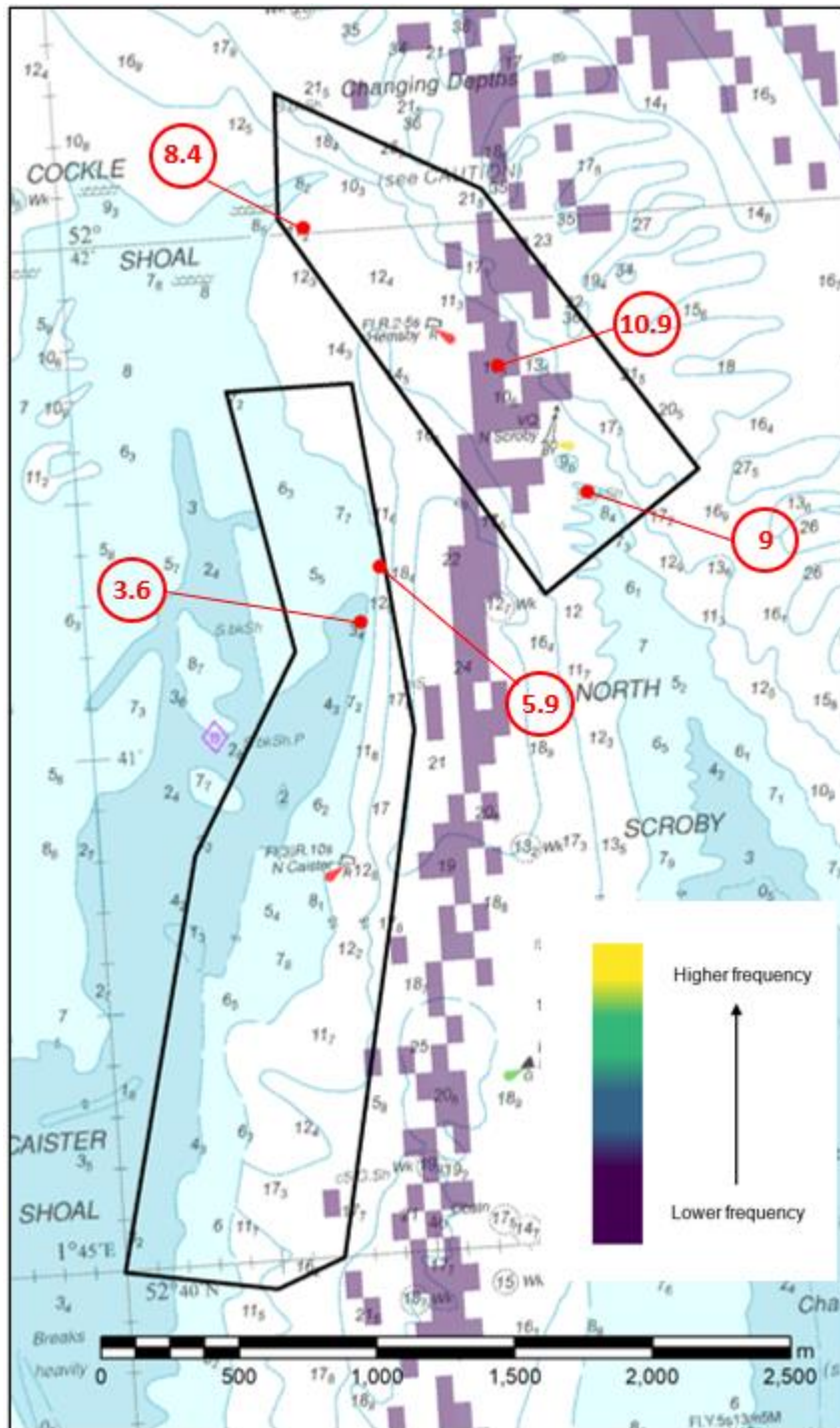


Figure 9: AIS ECDIS regulated annual tanker, passenger, and cargo vessel data from 2023 with Routine Resurvey area 1855 and controlling depth soundings (m) overlaid on BA Chart 1534.

6. RECOMMENDATIONS FOR FUTURE SURVEYS

Survey Interval

- 6.1 Due to the mobility of sand waves the 1-year frequency should be maintained on the focused areas EA3A and EA3B covering Caister Shoal, Cockle Shoal and North Scroby, with the 3-year frequency continued for the full area EA3.

Survey Area

- 6.2 The 5m and 10m contours within EA3A continue to migrate, pushing northeast towards the Hemsby buoy. The current limits have captured this movement in 2024, however, the 10m contour has not been determined entirely by the EA3A extents. It is suggested extending EA3A further northeast to adequately cover further movement.
- 6.3 It is suggested that the southernmost section of EA3A can be reduced as the 10m contour line has been observed to be retreating towards Caister Shoal. The reduction will compensate for the increase at the northeast section of EA3A.
- 6.4 EA3B survey limits are currently adequate to continue observing movement within that area.
- 6.5 Recommend that no change is made to EA3 to ensure there is no gap created between EA3 and EA4.

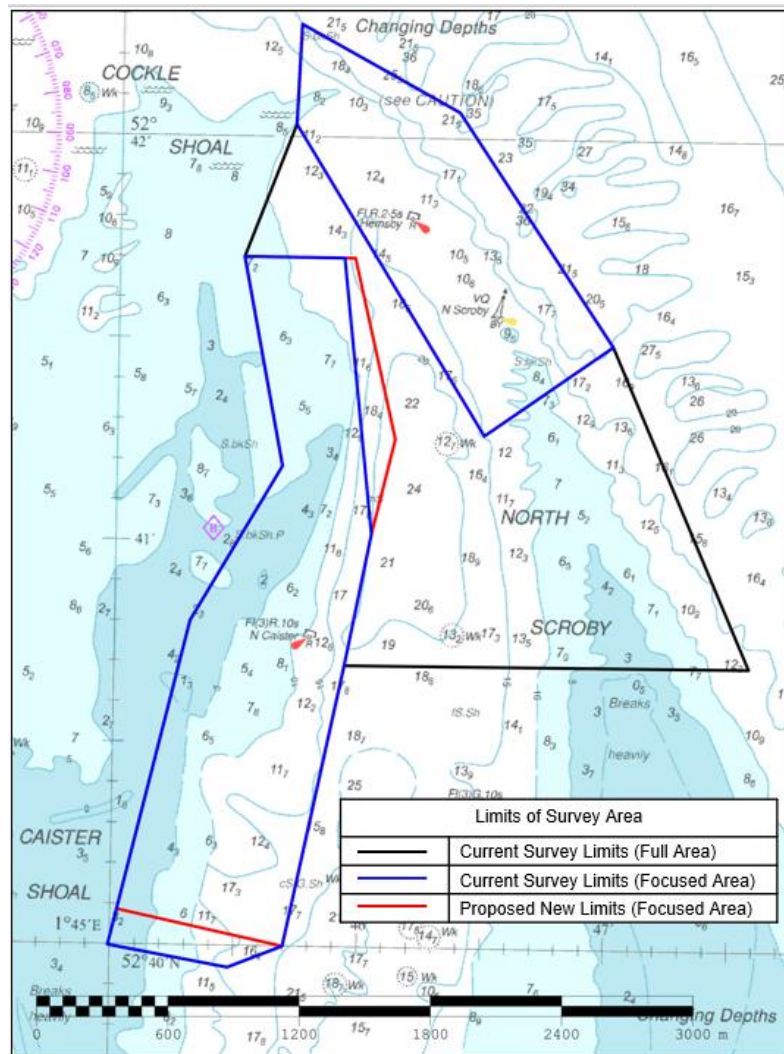


Figure 10: Recommended changes to survey limits of area EA3A & EA3B

The coordinates of the recommended adjusted survey area limits for the 1-year focused area EA3A are shown below:

Current Limits:

EA3A (focused) total area: 2.01 km²

Proposed New Limits:

EA3A (focused) total area: 2.02 km²

	Latitude	Longitude
1	52-41.702580N	001-45.500676E
2	52-41.702580N	001-45.950214E
3	52-41.256276N	001-46.123824E
4	52-41.020620N	001-46.032960E
5	52-40.695132N	001-45.931344E
6	52-39.999906N	001-45.699300E
7	52-40.085706N	001-45.025278E
8	52-40.801752N	001-45.303372E
9	52-41.186544N	001-45.667842E