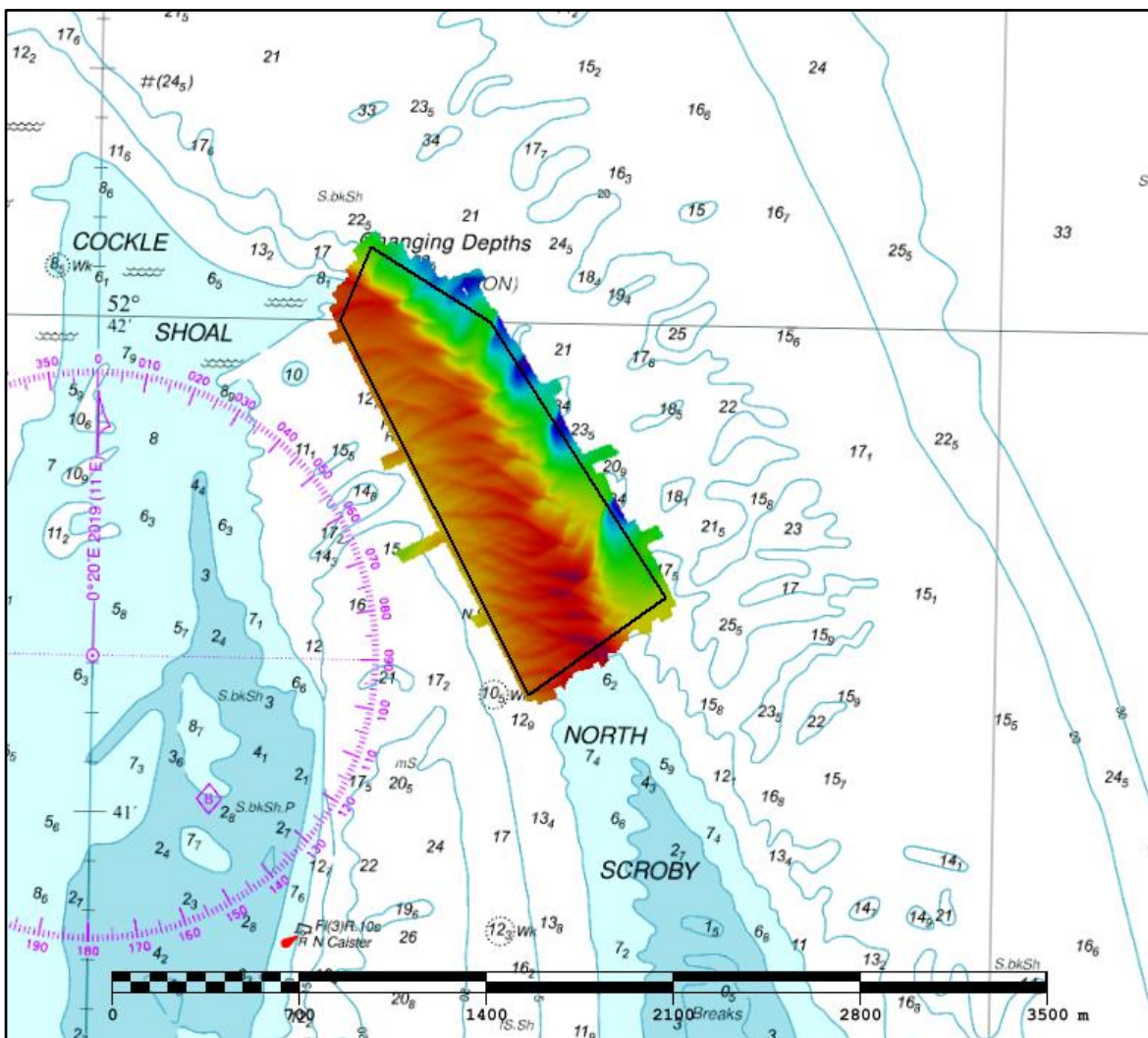




UK Hydrographic  
Office

## EAST ANGLIA COCKLE SHOAL FOCUSED AREA (EA3B) 2019 ASSESSMENT

An assessment of the 2019 hydrographic survey of the area EA3b Cackle Shoal Focused Area: 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 FOCUSED AREA (EA3B), 2019**

### **1. SUMMARY**

#### **Changes Detected**

- 1.1 Significant changes detected on eastern section of survey due to sand wave migration.
- 1.2 Least depth has moved south-east and shoaled by 0.2m since 2018, with another additional shallow area appearing.
- 1.3 Depths in the channel entrance between Hemsby and North Scroby Buoys is fairly stable.
- 1.4 The western section of the survey area remains more stable, consistent with historical trends in the area.

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

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

#### **Recommendations**

- 1.6 Given the location of the area and the significant changes in sections of the survey area, EA3b should remain on the annual survey interval.
- 1.7 Due to the migration of the sand waves in a southeast direction, the survey area should be extended further east and south in order to keep tracking the sand waves as they move into the deeper waters east of Scroby Sands.

### **2. LOCATION**

- 2.1 Survey interval at time of resurvey: Full EA3 area is surveyed every 3 years. Two focused areas (EA3a and EA3b) are surveyed annually.
- 2.2 Area Covered: 0.86 km<sup>2</sup>

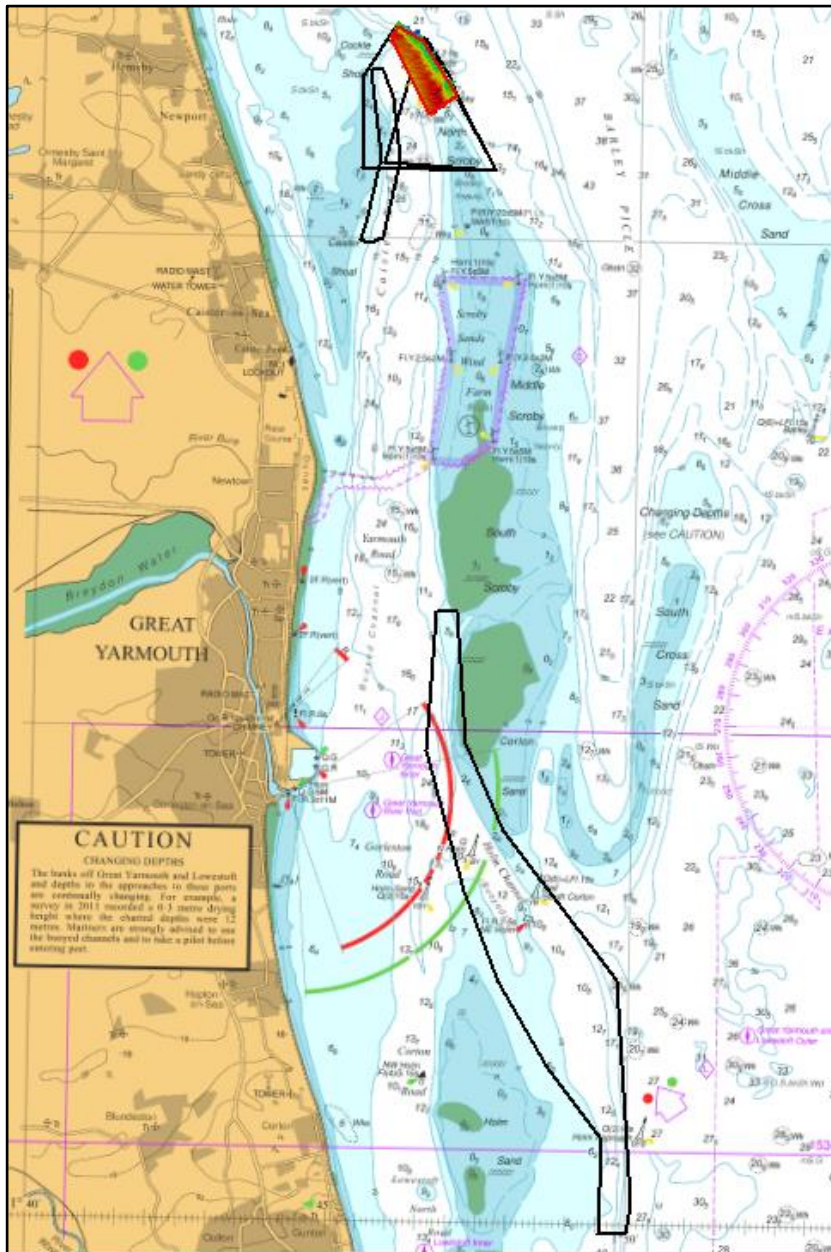


Figure 1: 2019 East Anglia Routine Resurvey areas overlaid on BA Chart 1543-0 with EA3b Cockle Shoal Focused Area shown in red.

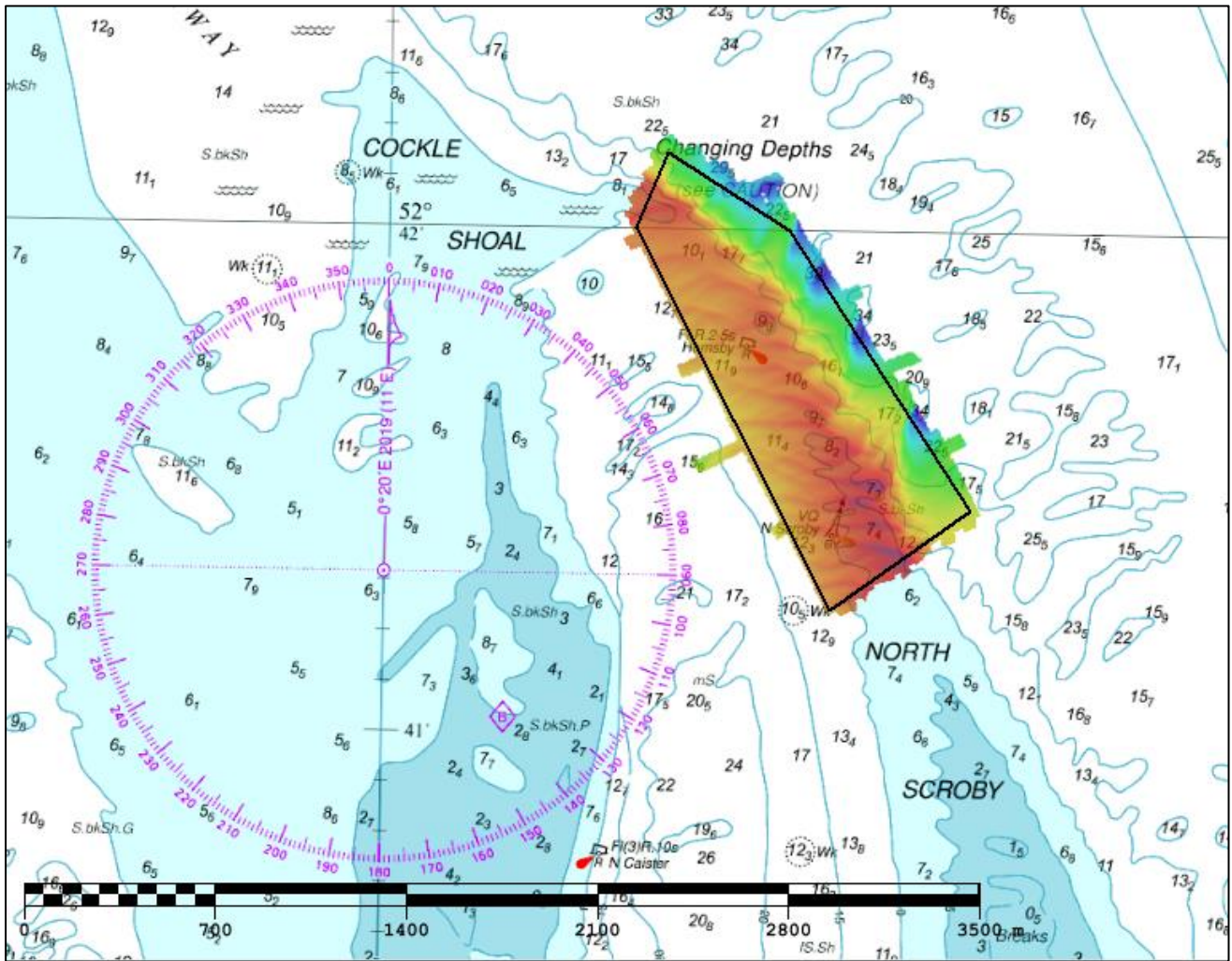


Figure 2: 2019 survey data overlaid on BA Chart 1534-0

### 3. REFERENCE SURVEY DETAIL

- 3.1 The previous focused survey (EA3b) was conducted as part of the 2018 Routine Resurvey Programme in October 2018 as part of HI1609. The previous full survey (EA3) was conducted as part of the 2017 Routine Resurvey Programme between July and November 2017 as part of HI1545. Another focused survey was conducted as part of the 2016 Routine Resurvey Programme in September 2016 as part of HI1521.
- 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 The latest focused survey as part of the 2019 Routine Resurvey Programme was conducted between September and October 2019 as part of HI1637.
- 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 Figures 4 and 5 show significant shoaling on the eastern half of the EA3b survey area as the sand waves migrate eastward. Shoaling is >5m in areas. The most significant change between 2016 and 2019 is -11.6m.
- 5.2 Depths in the channel entrance between Hemsby and North Scroby Buoys is fairly stable, with the controlling depth being 9.8m, compared to 9.7m in 2018.
- 5.3 The western half of the survey area is more stable. Changes have remained within the range of -2m to 1.5m across the previous surveys (see Figure 7).
- 5.4 The 2019 survey shows two areas of least depth (7.2m) (Figure 3). The first has shoaled -0.2m since the 2018 least depth of 7.4m and is now located approximately 250m SE of the North Scroby Buoy. The second least depth location is approximately 210m NE of the North Scroby Buoy.
- 5.5 The most significant depth change since 2018 is -9.7m (see Figures 6 and 7) where a scour area has shifted southwards.

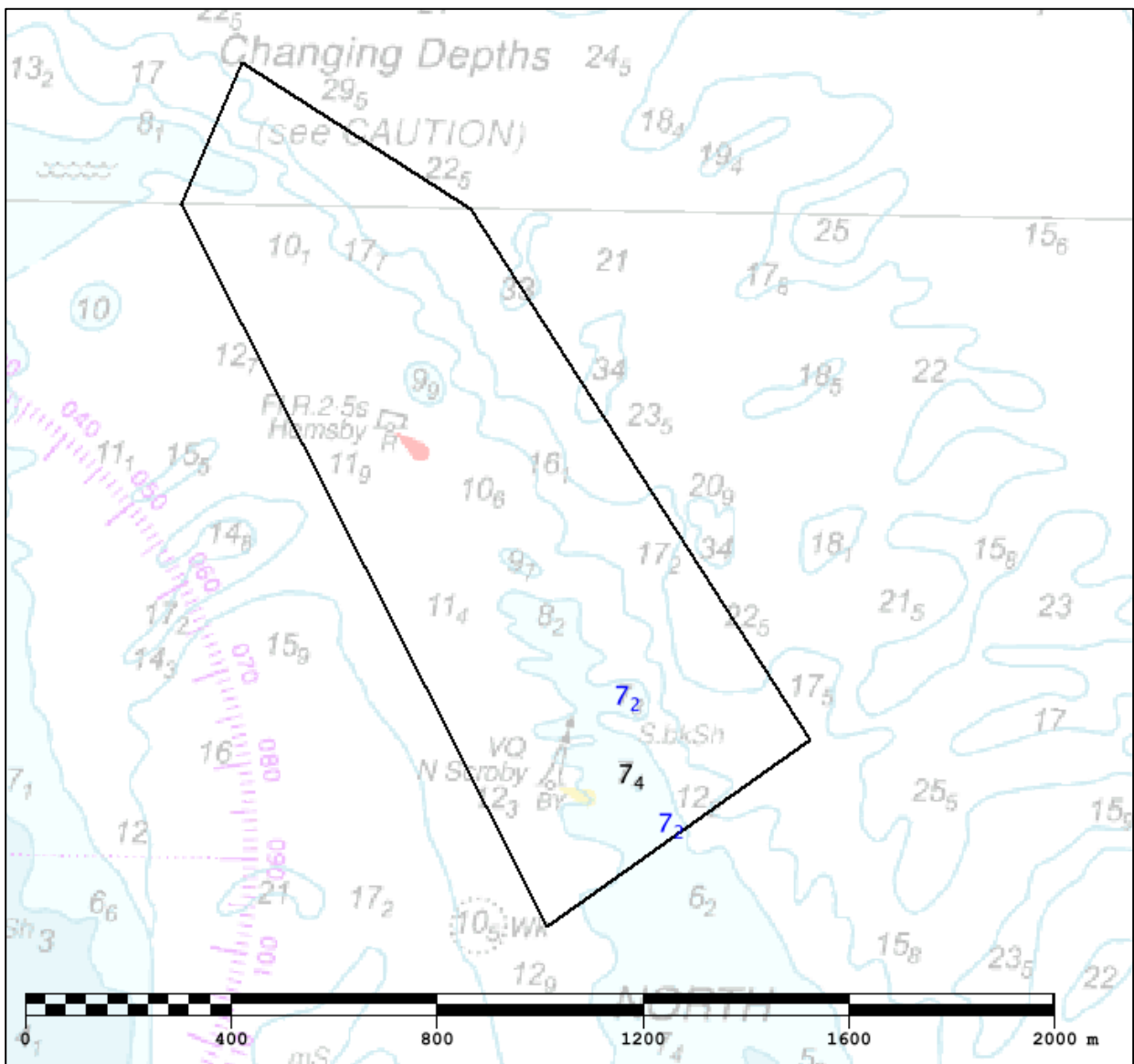


Figure 3 – Least Depth Diagram with 2019 Least Depths in Blue and 2018 Least Depth in Black.

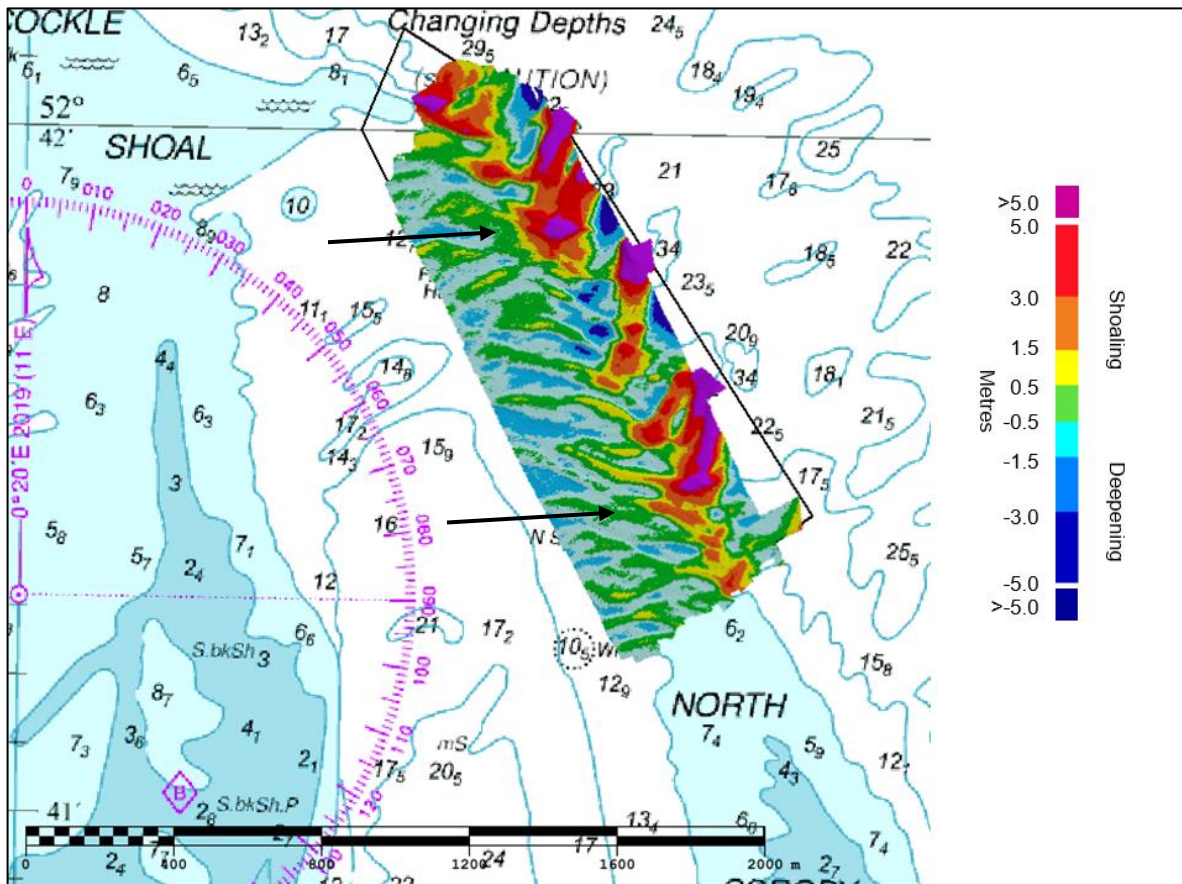


Figure 4: Difference surface showing bathymetric changes between the 2016 and 2019 surveys overlaid on BA Chart 1534-0 (Black arrows represent sand wave migration since 2016 survey)

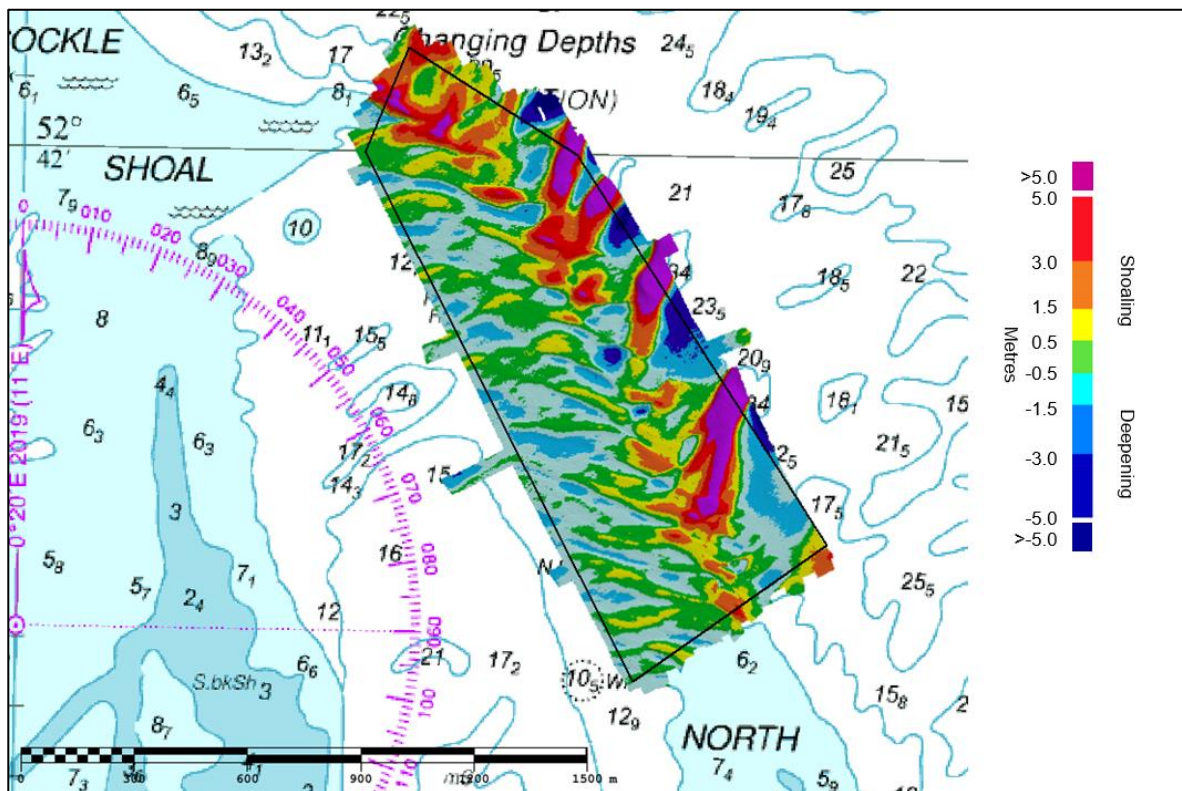


Figure 5: Difference surface showing bathymetric changes between the 2017 and 2019 surveys overlaid on BA Chart 1534-0.

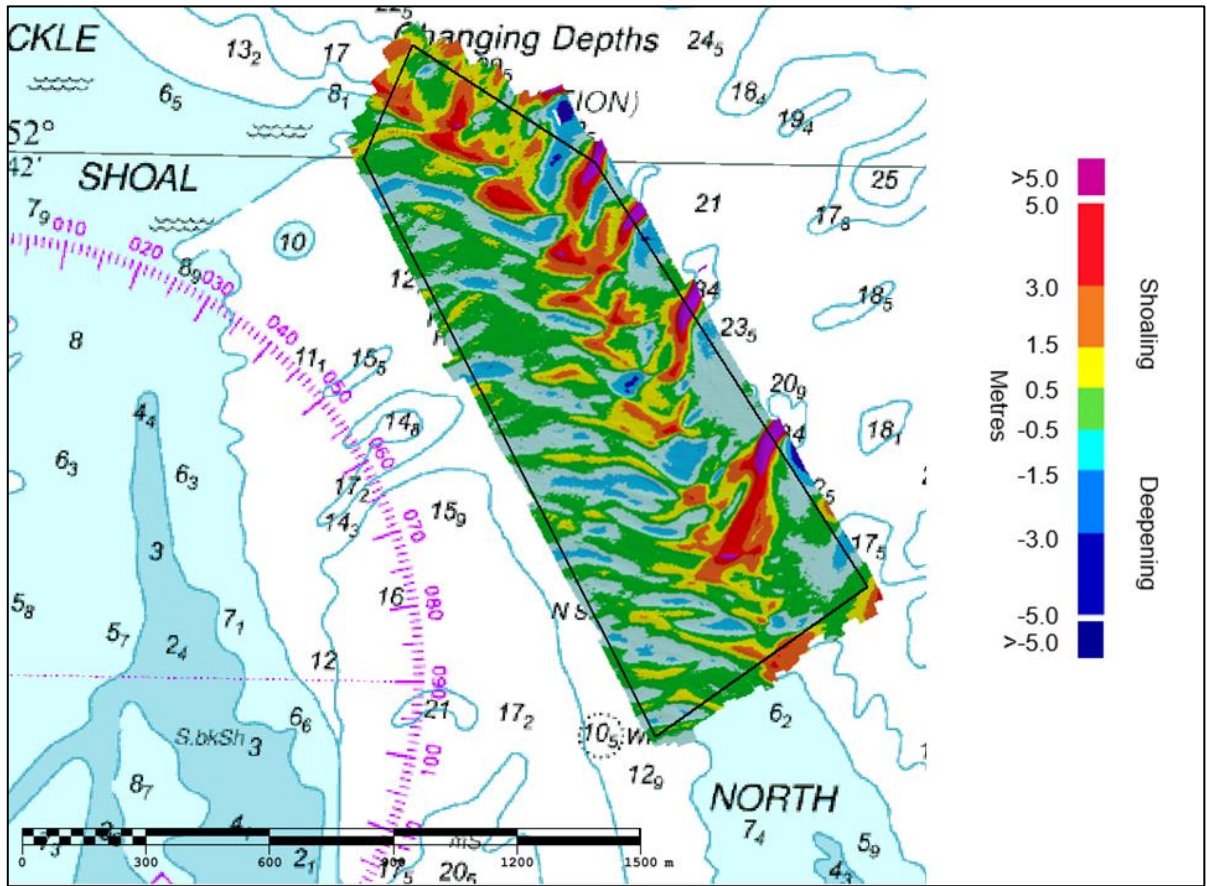


Figure 6: Difference surface showing bathymetric changes between the 2018 and 2019 surveys overlaid on BA Chart 1534-0.



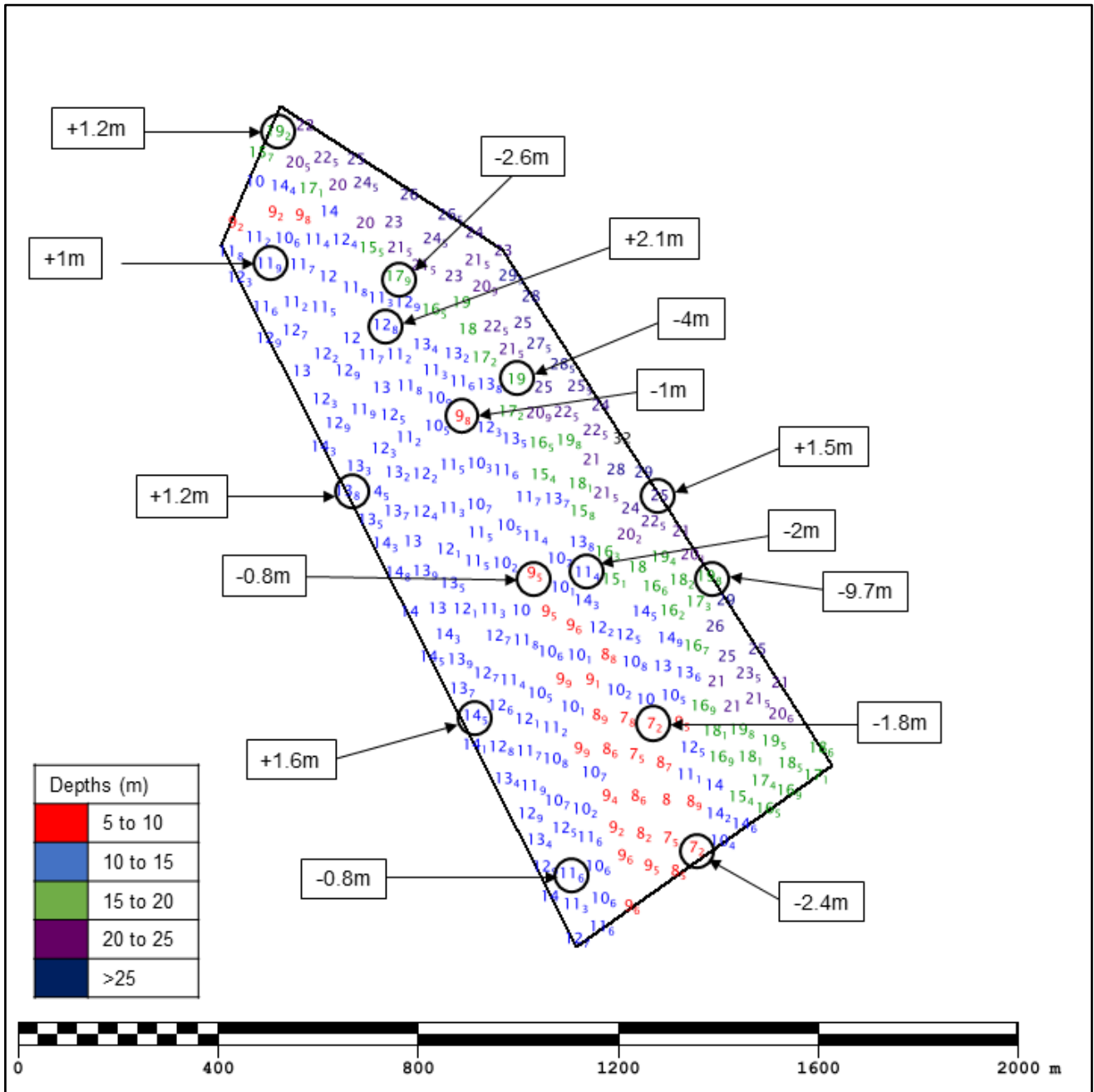


Figure 7: Colour banded depth plot from the 2019 survey with selected depth changes since the 2018 survey. Positive values (+) represent deepening. Negative values (-) represent shoaling.

## 6. RECOMMENDATIONS FOR FUTURE SURVEYS

### Survey Interval

6.1 Given the location of the area and the mobility of the shoal areas on the seabed, EA3b should remain on the annual survey interval.

### Survey Area

6.2 Due to the southeast migration of the sand waves and scours on the seabed, with depth changes of >9m in a 12-month period, it is suggested to extend the survey area towards the east to keep

tracking the sand waves as they move into the navigation channel between the North Scroby and Hemsby buoys.

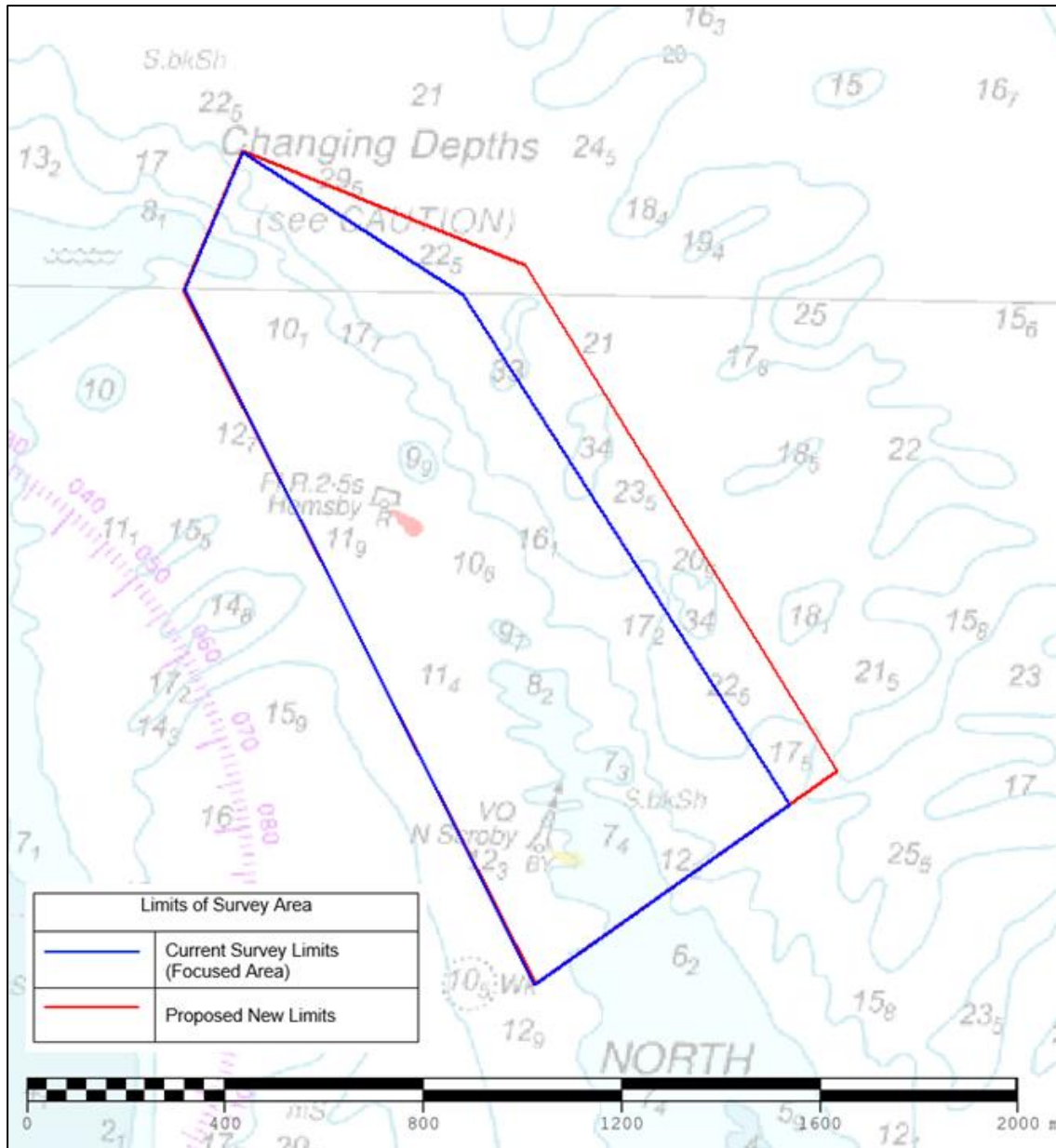


Figure 8: Recommended changes to survey limits of area EA3b

The coordinates of the recommended adjusted survey area limits for the annual focused area EA3b are shown below:

EA3b total area: 1.04 km<sup>2</sup>

A	52.700004	1.763332
B	52.702543	1.765039
C	52.700580	1.773442
D	52.691478	1.783047
E	52.687563	1.774218