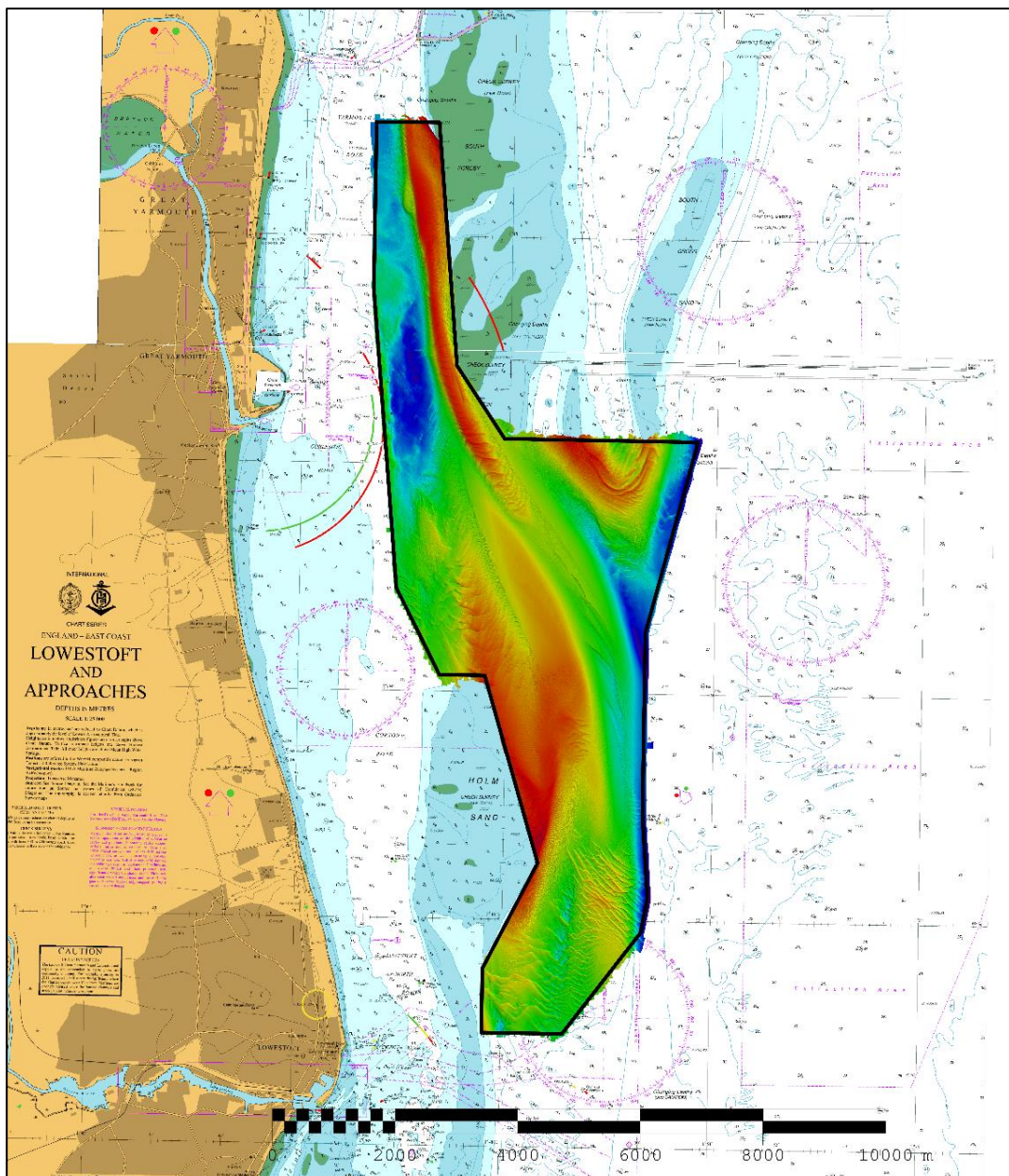




UK Hydrographic  
Office

## EAST ANGLIA HOLM CHANNEL FULL (EA9) 2023 ASSESSMENT

An assessment of the 2023 hydrographic survey of the area EA9: 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.

## **EA9 HOLM CHANNEL, 2023**

### **1. SUMMARY**

#### **Changes Detected**

- 1.1 Holm Sand continues to move NNW, gradually constricting Holm Channel further, with two significant depths of 10.2m and 9.4m in the area. This trend can be seen throughout previous surveys.
- 1.2 In the southern half of the survey, two significant depths of 6.4m and 8.5m are shown. The 6.4m is the shoalest depth in the patch of sandwaves, which is 0.4m shoaler than the least depth in this area in 2020. The 8.5m sounding is outside the previously charted 10m contour and is 0.8m shoaler than the general depth of sandwaves in that area in 2020.
- 1.3 The 10m contour continues to migrate NNW at the northern tip of Holm Sand and expand seaward along the eastern side.
- 1.4 The 10m contour at the southern end of South Cross Sand continues to migrate N into Barley Picle.
- 1.5 South Scroby and Corton Sand continue to migrate westward.

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

- 1.6 Depths in the area remain critical for passage through Holm Channel, as well as for monitoring the movement of the significant seabed features such as Holm Sand, South Scroby, Corton Sand and South Cross Sand.

#### **Recommendations**

- 1.7 Given the mobility and shoaling of the significant seabed features, the full EA9 area should remain on a 3-year survey interval, with the focused area surveyed annually.
- 1.8 The full area fully encompasses the mobility of the current seabed features and is sufficient – the extra area surveyed around South Cross Sand should be maintained, with possible further extension N in ~3-4 years. The focused area will also be sufficient for the next survey; however, it may need reviewing after the 2024 surveys to see whether further areas of mobility warrant annual analysis.

### **2. LOCATION**

- 2.1 Survey interval at time of resurvey: 3 years Full, with a Focused area surveyed annually.
- 2.2 Area Covered: 37.22 km<sup>2</sup>



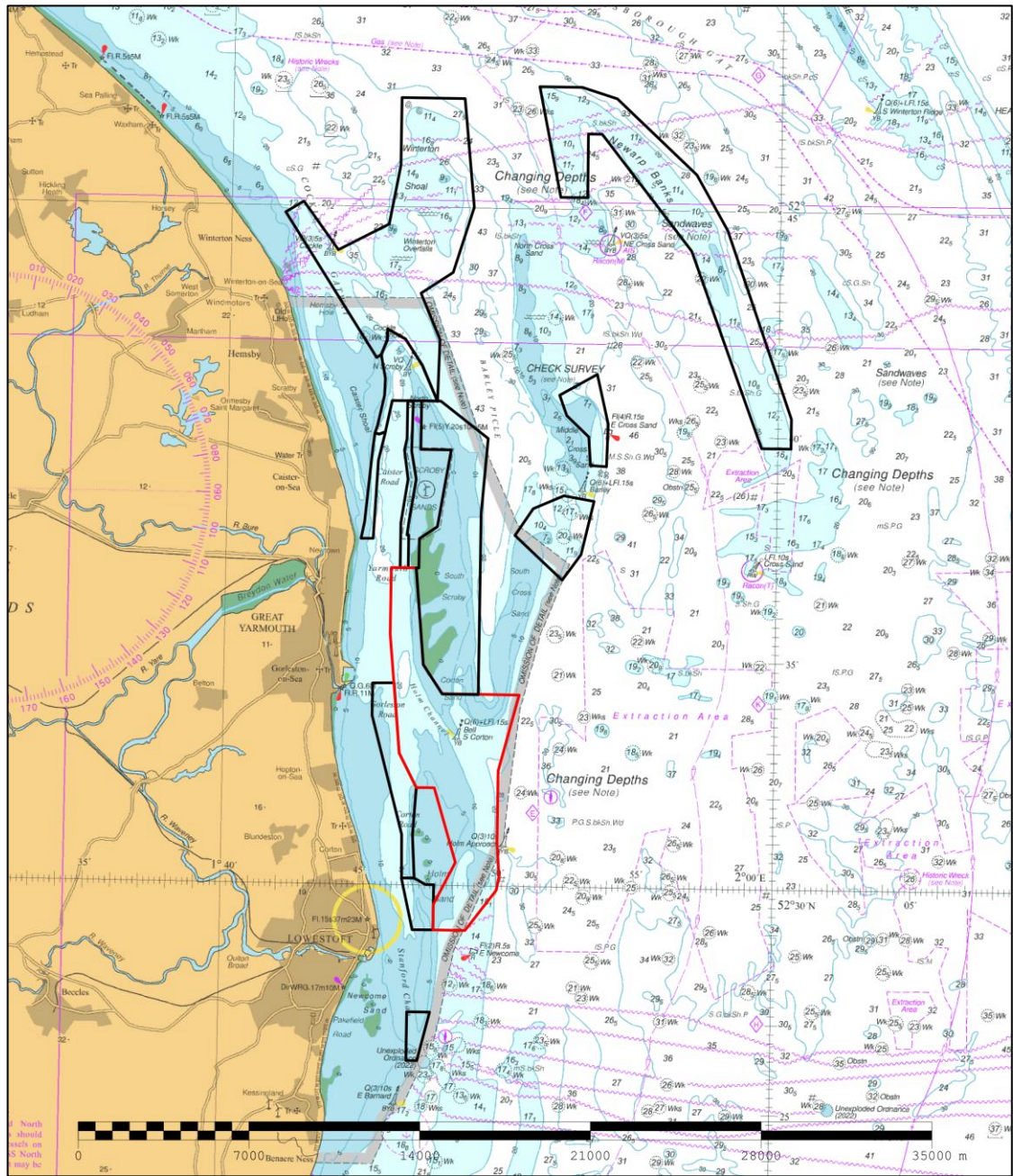


Figure 1: 2023 East Anglia Routine Resurveys, areas overlaid on BA Chart 1504-0 with area EA9 Full in red.

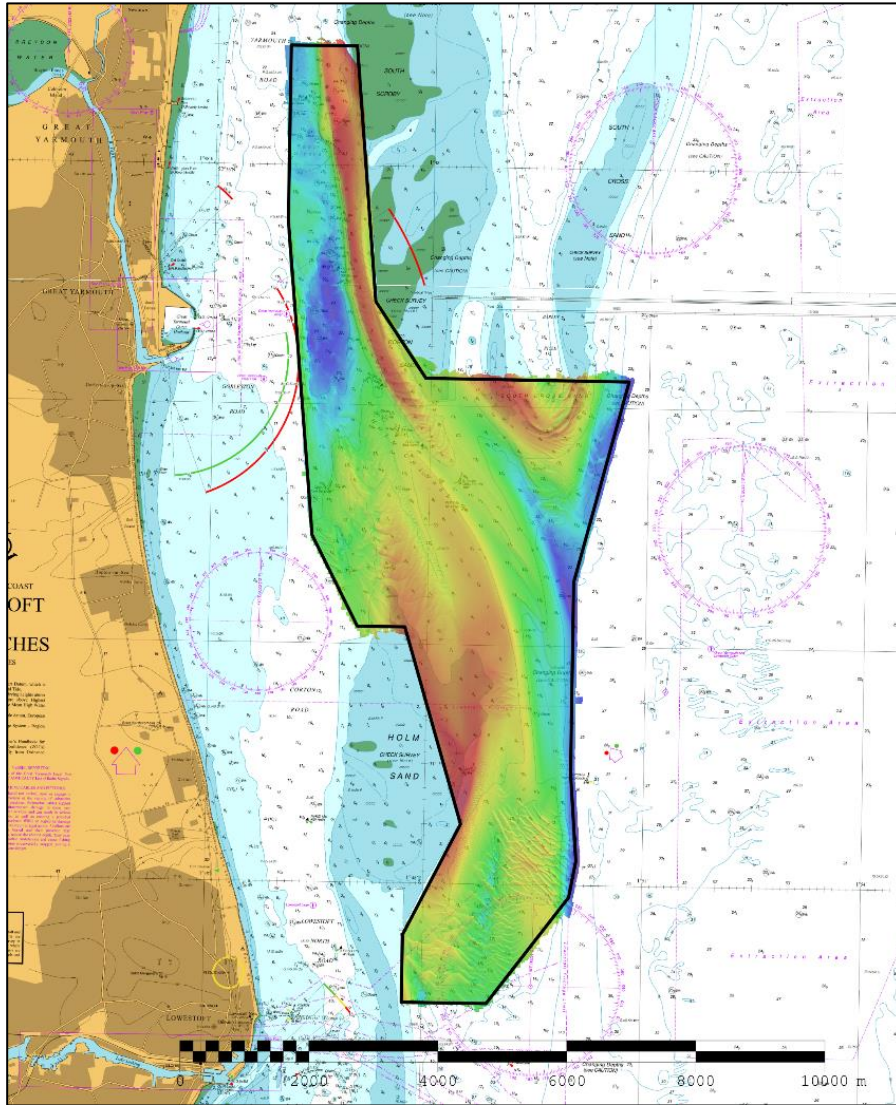


Figure 2: 2023 survey data overlaid on BA Charts 1534-0 and 1535-0.

### 3. REFERENCE SURVEY DETAIL

- 3.1 The previous full survey was undertaken as part of the 2020 Routine Resurvey Programme in October 2020 as part of HI1687. Two focused surveys were executed in the interim. The previous focused survey was conducted in September 2022 as part of HI1761. The focused survey before that, was part is HI1737, surveyed between September and October 2021. Two further full surveys, also analysed in this report, were conducted in 2014 between June and September as part of HI1458, and in 2011 between May and July as part of HI1367.
- 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 survey is part of HI1828, surveyed between August and September 2023.
- 4.2 This report will also reference surrounding data from HI1825 EA5 Scroby Sands, HI1827 EA8a The Roads and HI1829 EA10C West Holm Focused, all surveyed between September and November 2023.



4.3 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.

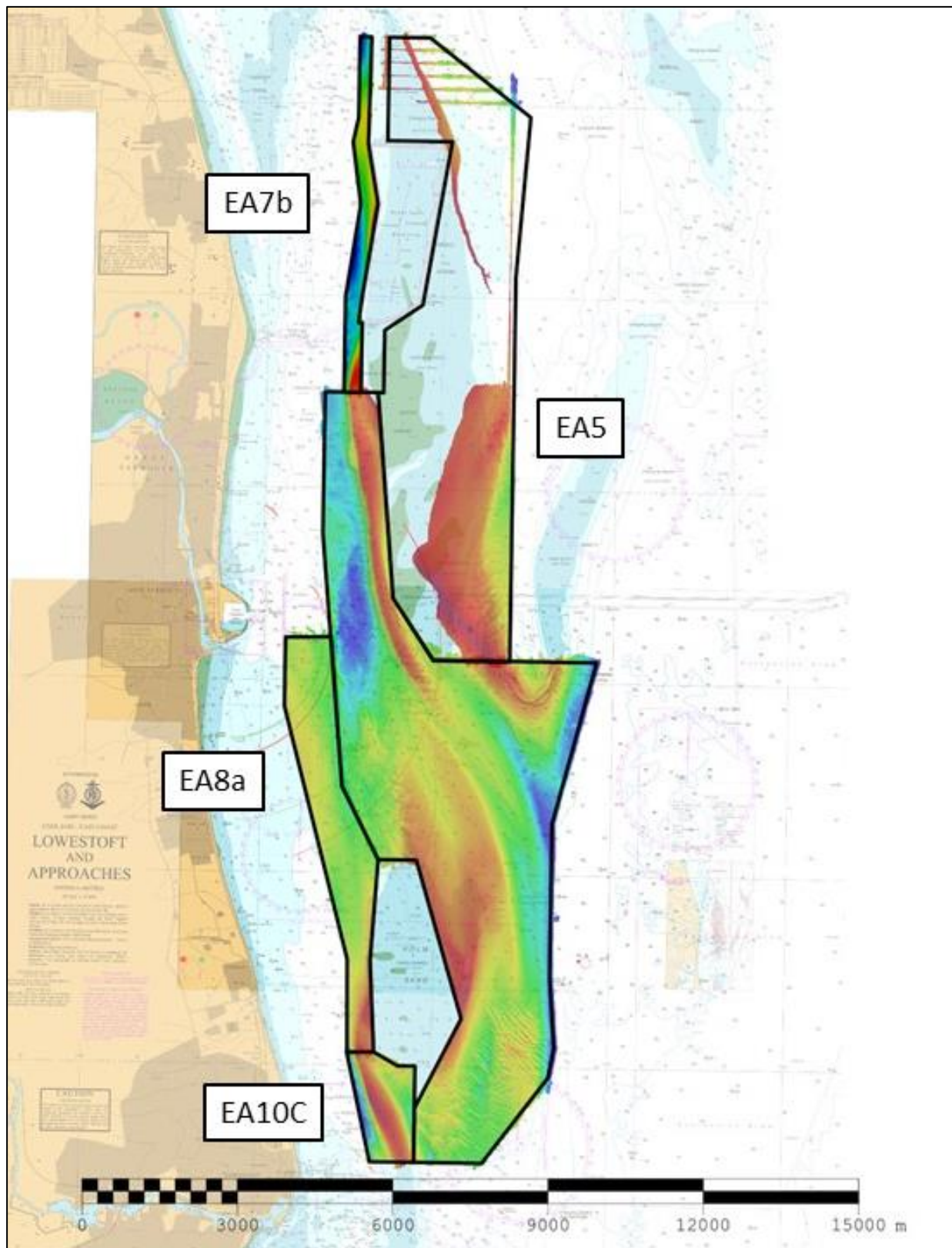


Figure 3: 2023 survey data of EA9 with adjoining areas EA5, EA8a and EA10C overlaid on BA Charts 1534-0 and 1535-0.

## 5. DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 5.1 Holm Channel is an area that experiences significant change, seen in Figures 7-11. Of particular interest is the Holm Channel section itself (between the northern end of Holm Sand and southern tip of Corton Sand). Two significant depths have been shown in this channel of 10.2m and 9.4m seen in Figures 4 and 5 (close-up). The pattern over the previous three surveys shows the steady NNW movement of the tip of the sandbank (also shown in the 10m contours in Figure 12).
- 5.2 Two further significant depths are shown in the southern end of the survey area in Figure 4 (close-up in Figure 6) of 6.4m and 8.5m. The depth of 6.4m is shown as is the shoalest sounding within the 10m contour section. This has shoaled in that specific location by 1.8m since 2020, however, compared to the general shoalest sounding of those sandwaves in 2020, the 6.4m depth is only 0.4m shoaler. The 8.5m sounding is on a sandwave situated outside the charted 10m contour and is 3.0m shoaler in that location than in 2020, but 0.8m shoaler than the average sandwave heights in the area.
- 5.3 The 10m contour plot in Figure 12 shows the continued migration NNW of the tip of Holm Sand (~420m since 2020, and 100m in the last year) further constricting the channel, as well as a general seaward/easterly expansion of the east bank of Holm Sand. [Longer term analysis of the 10m contour is discussed in the Appendices].
- 5.4 Figure 9 shows the W side of South Scroby has experienced shoaling due to the migration W since 2020. Similarly, the western side of Corton Sand has migrated W over the last few years (Figures 7-11).
- 5.5 Figure 3 shows the EA9 area with data from adjoining areas displayed alongside. This helps to paint a fuller picture of the general current positions of Holm Sand, South Scroby and Corton Sands. The overall shape of Holm Sand for example can be inferred when pieced together with EA8a and EA10C.
- 5.6 Figure 13 shows the 10m contour at South Cross Sand from 2023, 2014 and 2011. The survey area for 2023 was extended in order to cover this feature and provide analysis of its behaviour over the last 12 years. The 10m contour can be seen to be retreating steadily north into the Barley Pickle area on the chart, shifting ~250m N since 2011. It also shows the retreat of the south end of Corton Sand in a NNW direction (also shown in Appendix A and B).
- 5.7 An overall migration W of Corton Sand and South Scroby can be seen by looking at areas EA9 and EA5 overlaid on the current charted depths (Figure 3) – for further analysis of EA5 please see associated EA5 report.

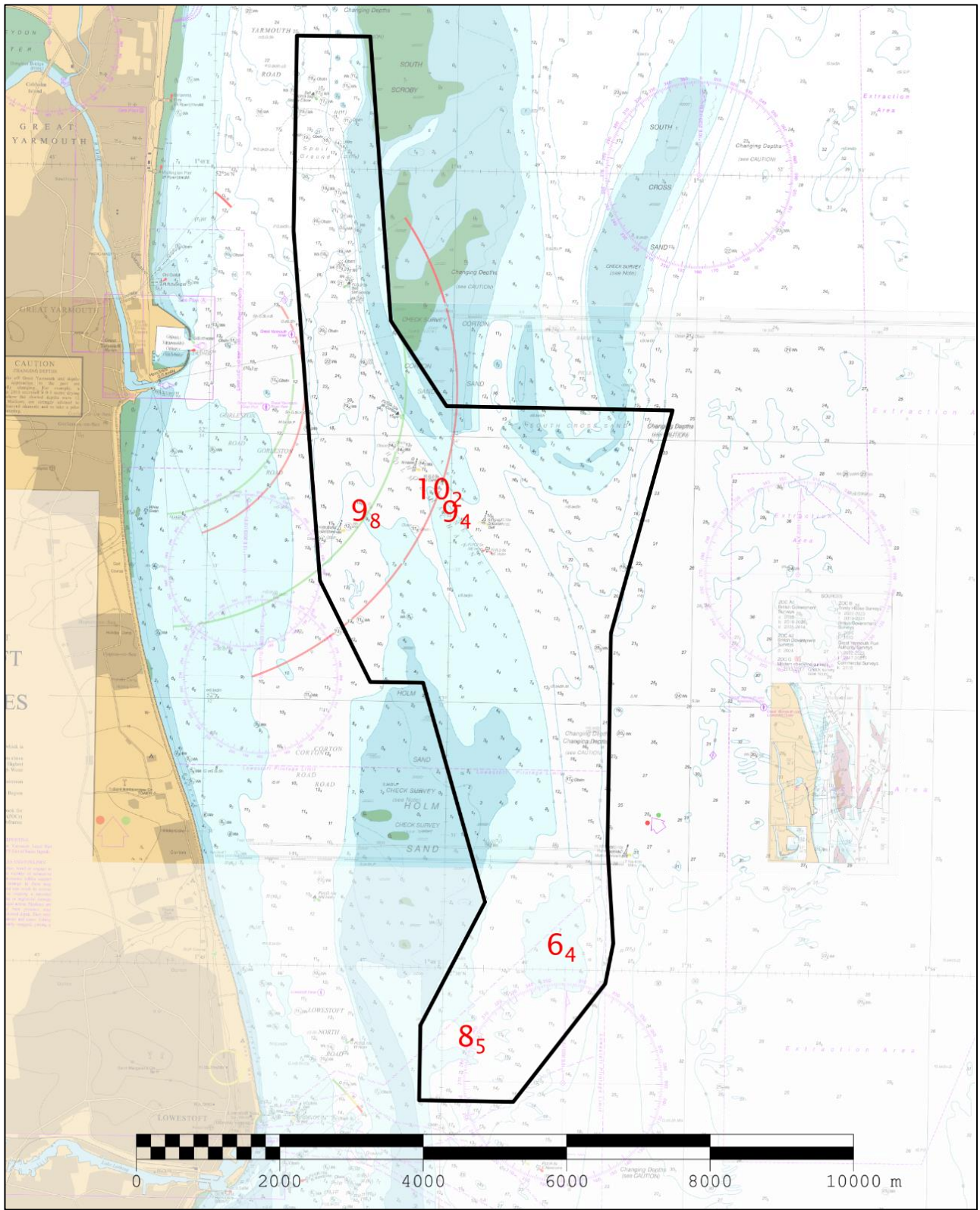


Figure 4: Significant Depth soundings highlighted, overlaid on BA Charts 1534-0 and 1535-0.



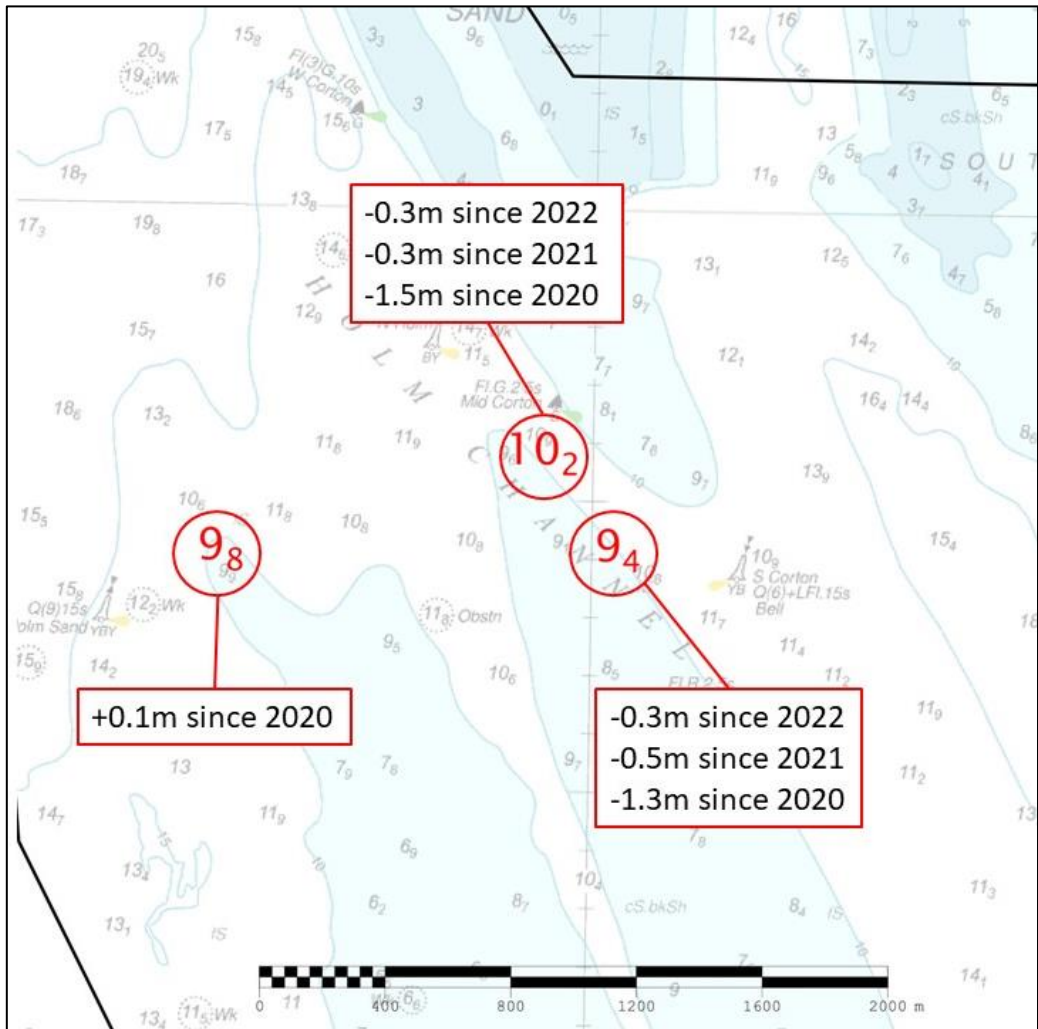


Figure 5: Significant Depth soundings - Holm Channel close-up, overlaid on BA Chart 1535-0.

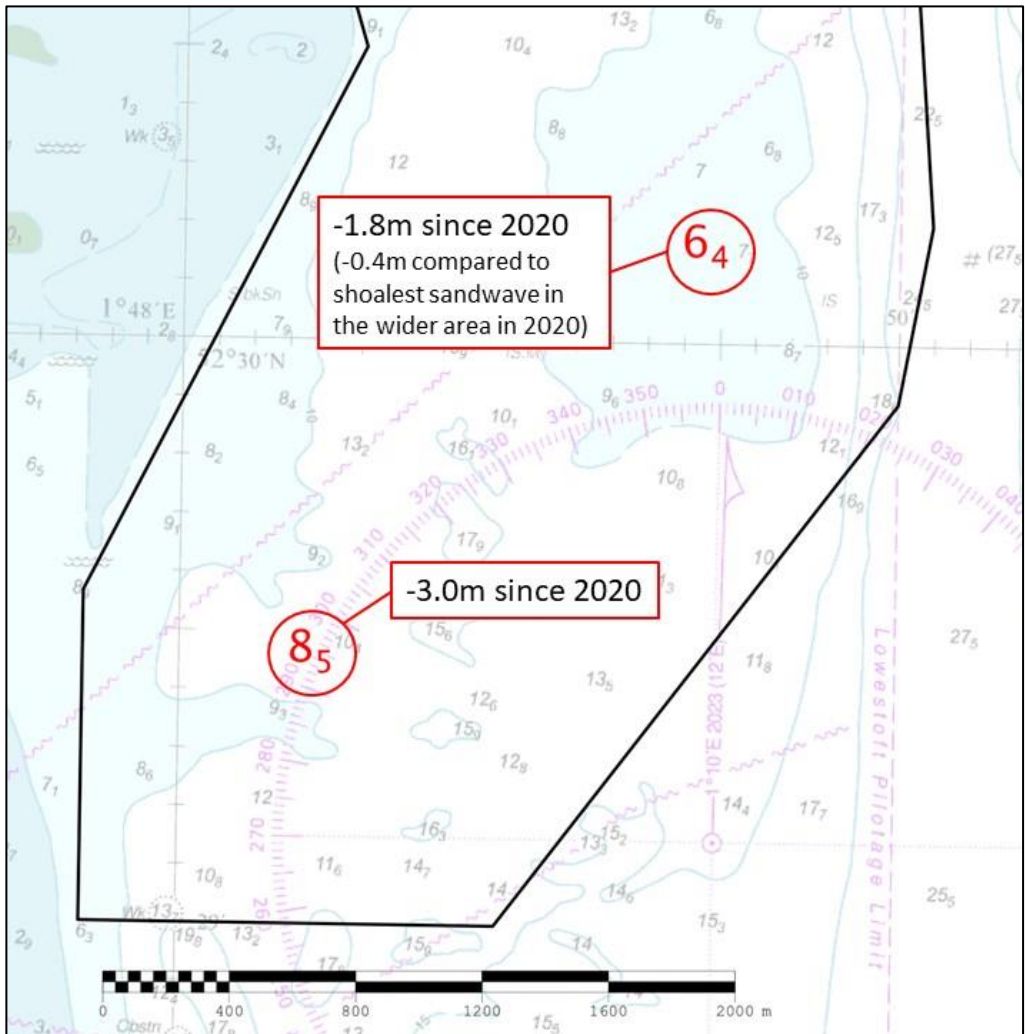


Figure 6: Significant Depth soundings - south of Holm Sand close-up, overlaid on BA Chart 1535-0

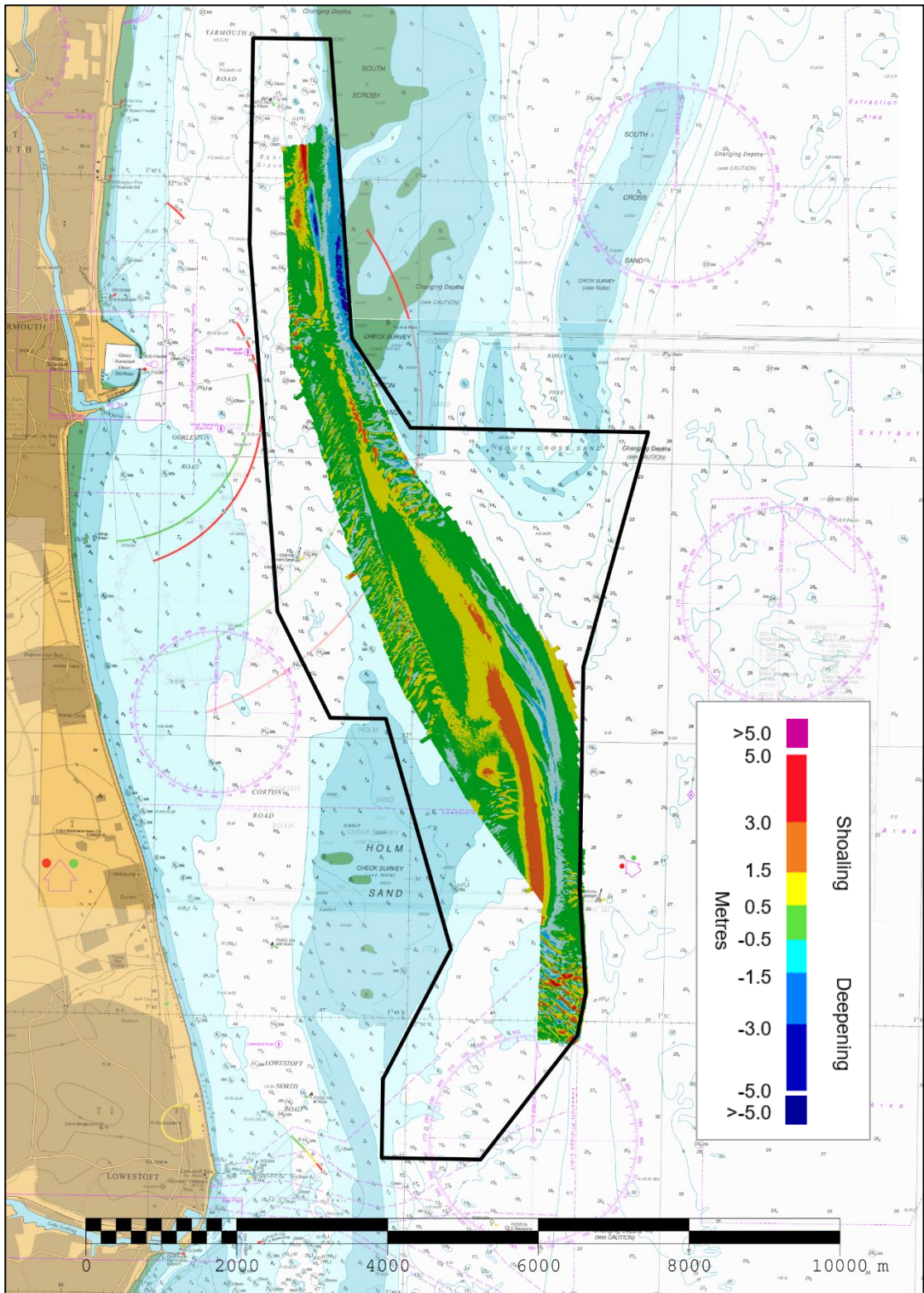


Figure 7: Difference surface showing bathymetric changes between the 2023 and 2022 surveys overlaid on BA Charts 1534-0 and 1535-0.



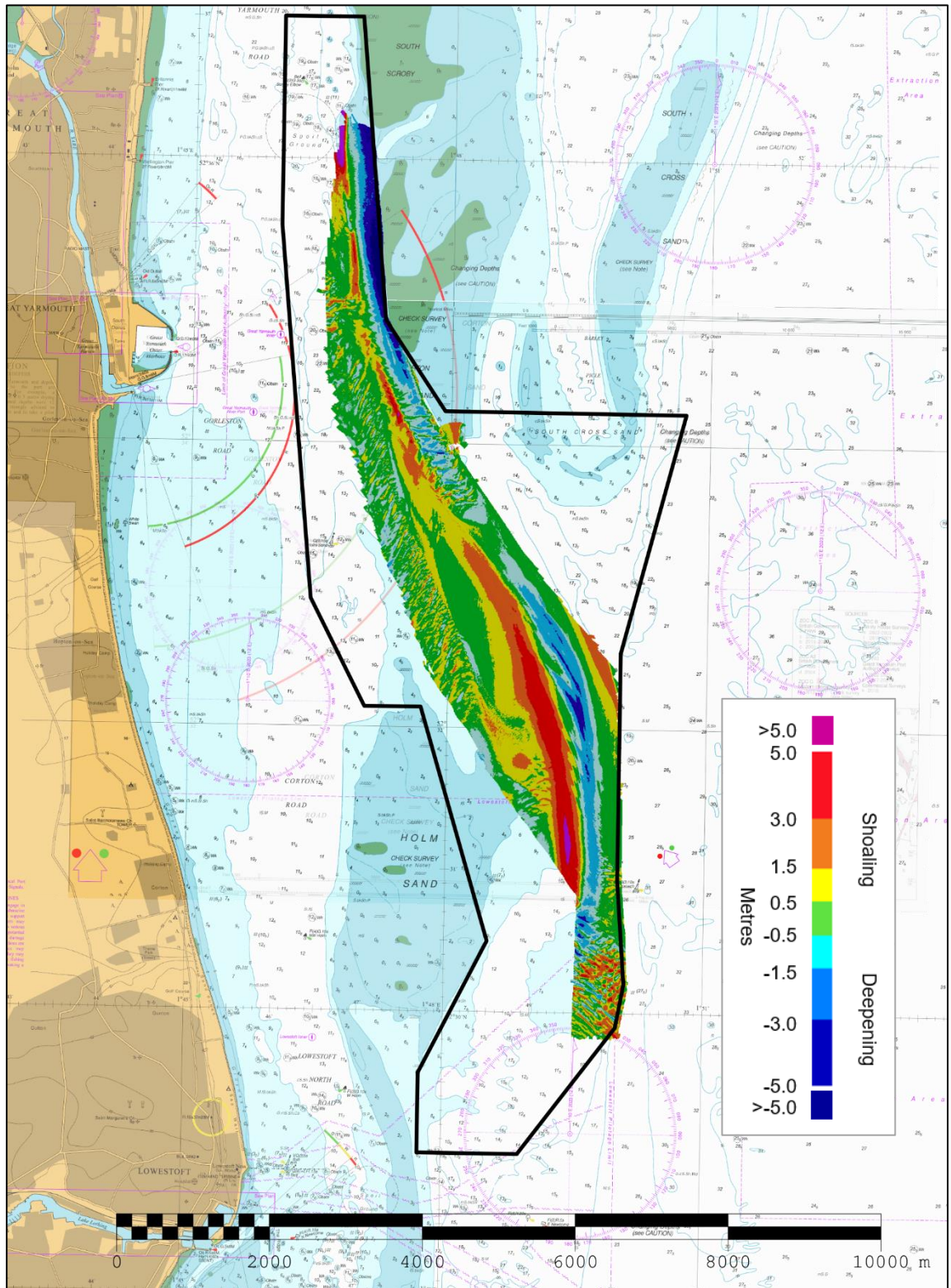


Figure 8: Difference surface showing bathymetric changes between the 2023 and 2021 surveys overlaid on BA Charts 1534-0 and 1535-0.



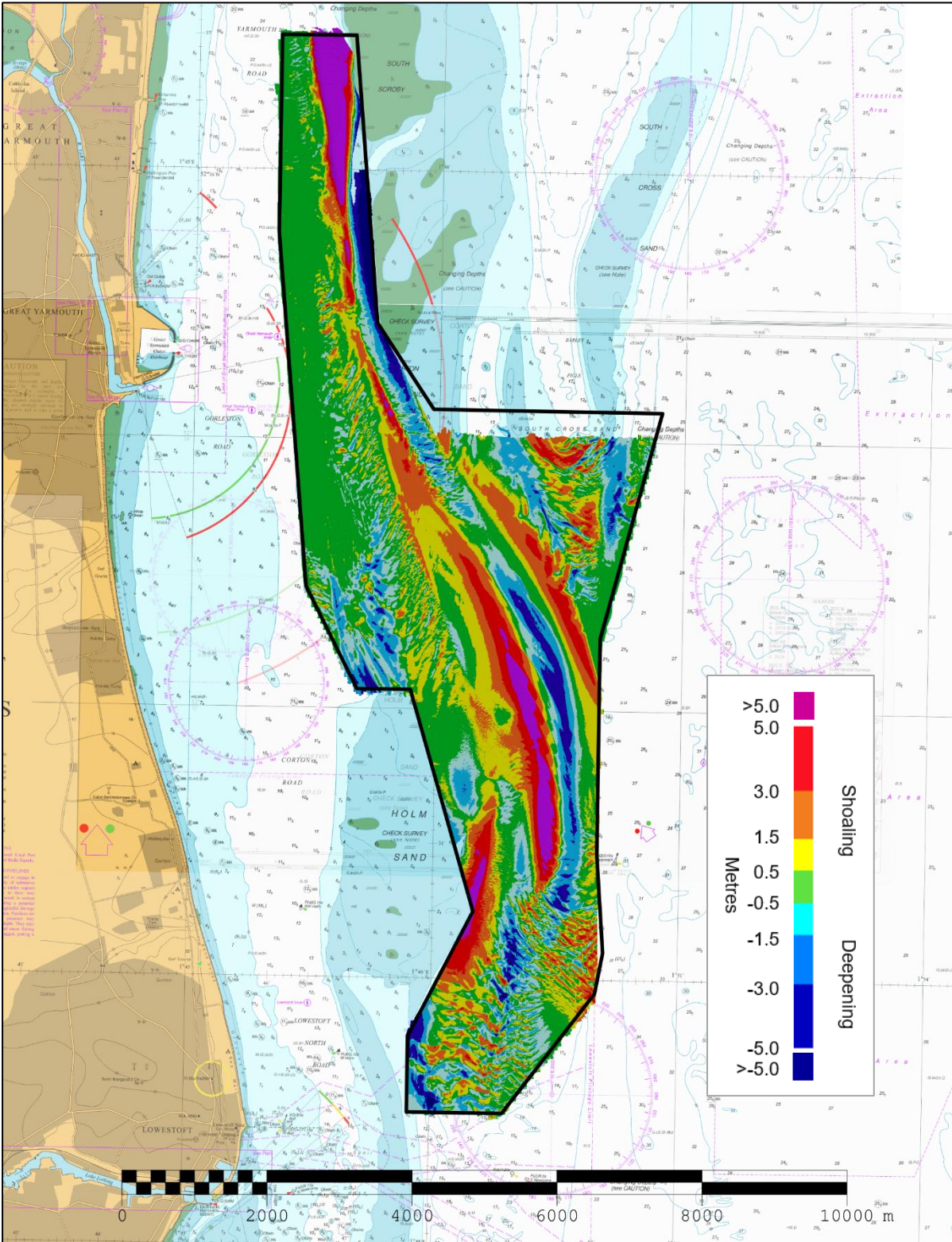


Figure 9: Difference surface showing bathymetric changes between the 2023 and 2020 surveys overlaid on BA Charts 1534-0 and 1535-0.

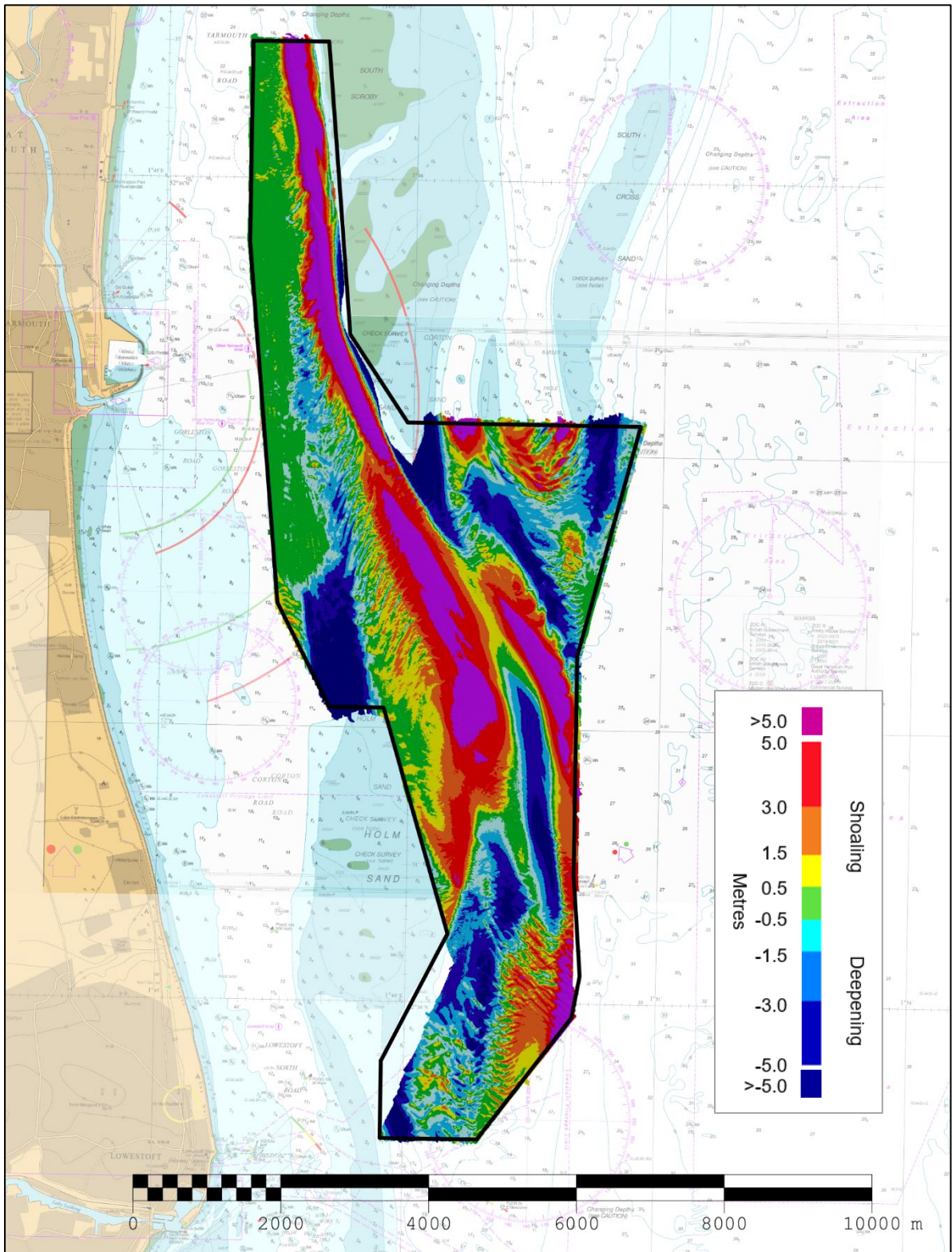


Figure 10: Difference surface showing bathymetric changes between the 2023 and 2014 surveys overlaid on BA Charts 1534-0 and 1535-0.



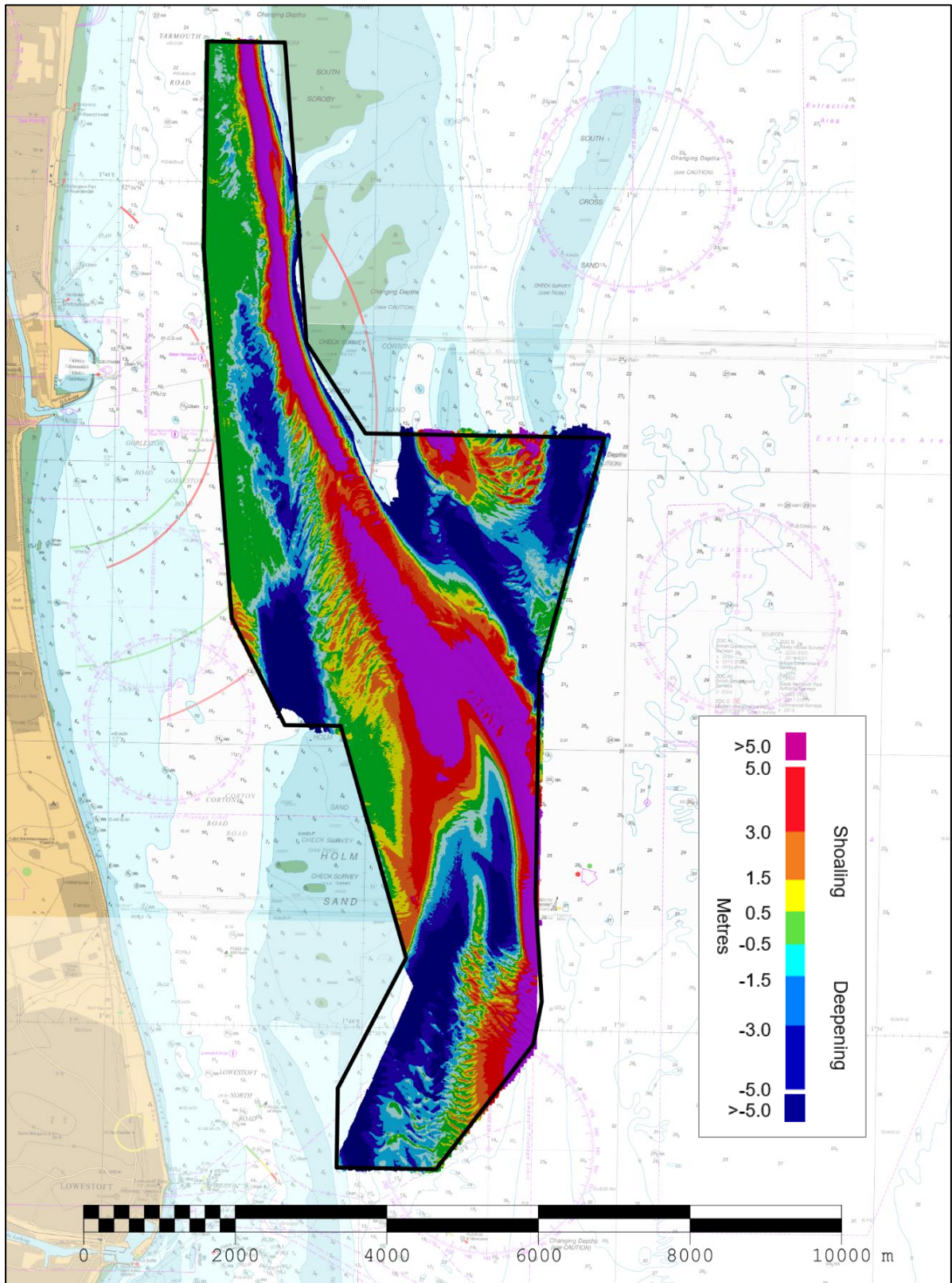


Figure 11: Difference surface showing bathymetric changes between the 2023 and 2011 surveys overlaid on BA Charts 1534-0 and 1535-0.

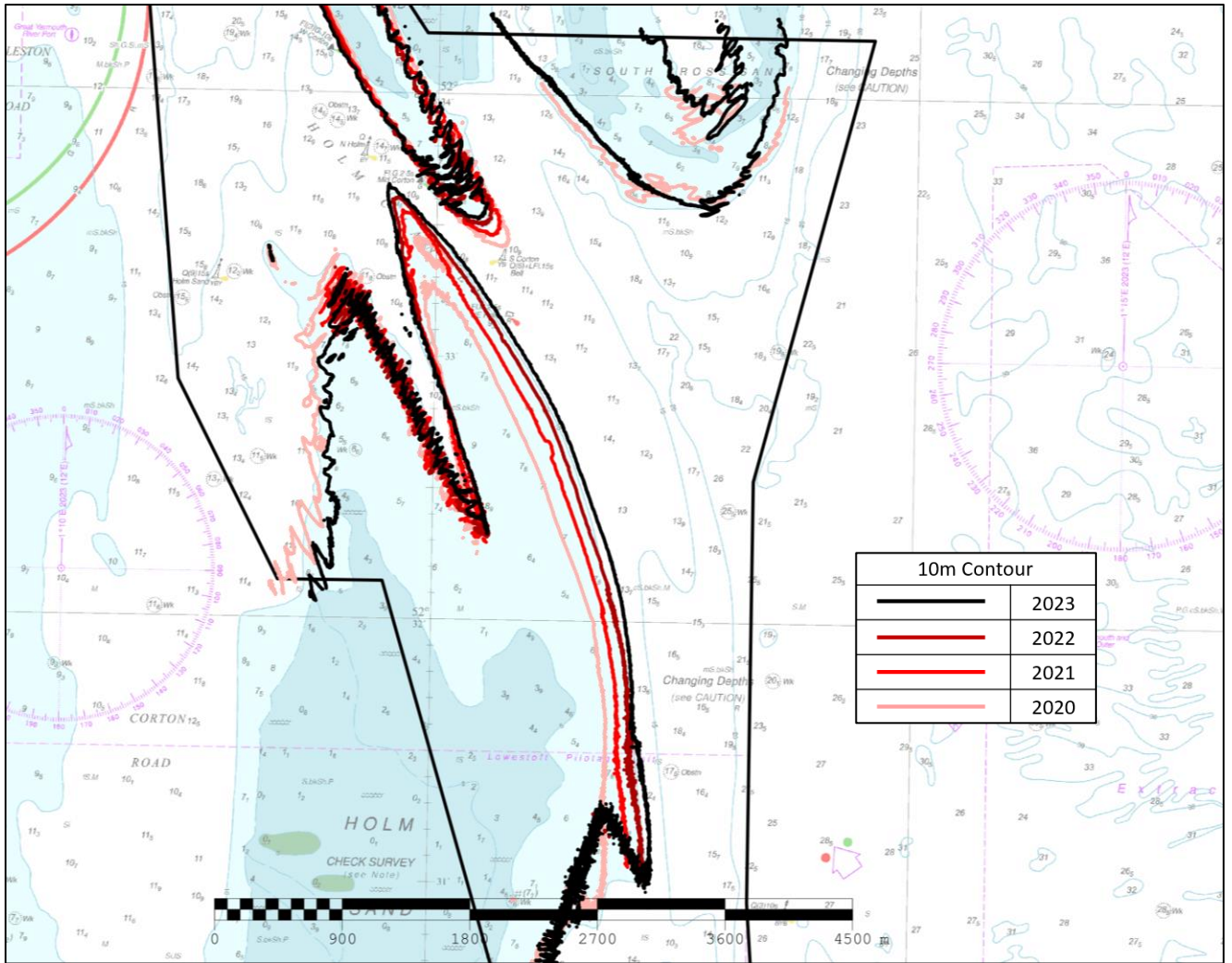


Figure 12: Contour plot showing changes in the 10m contours from 2020 to 2023.

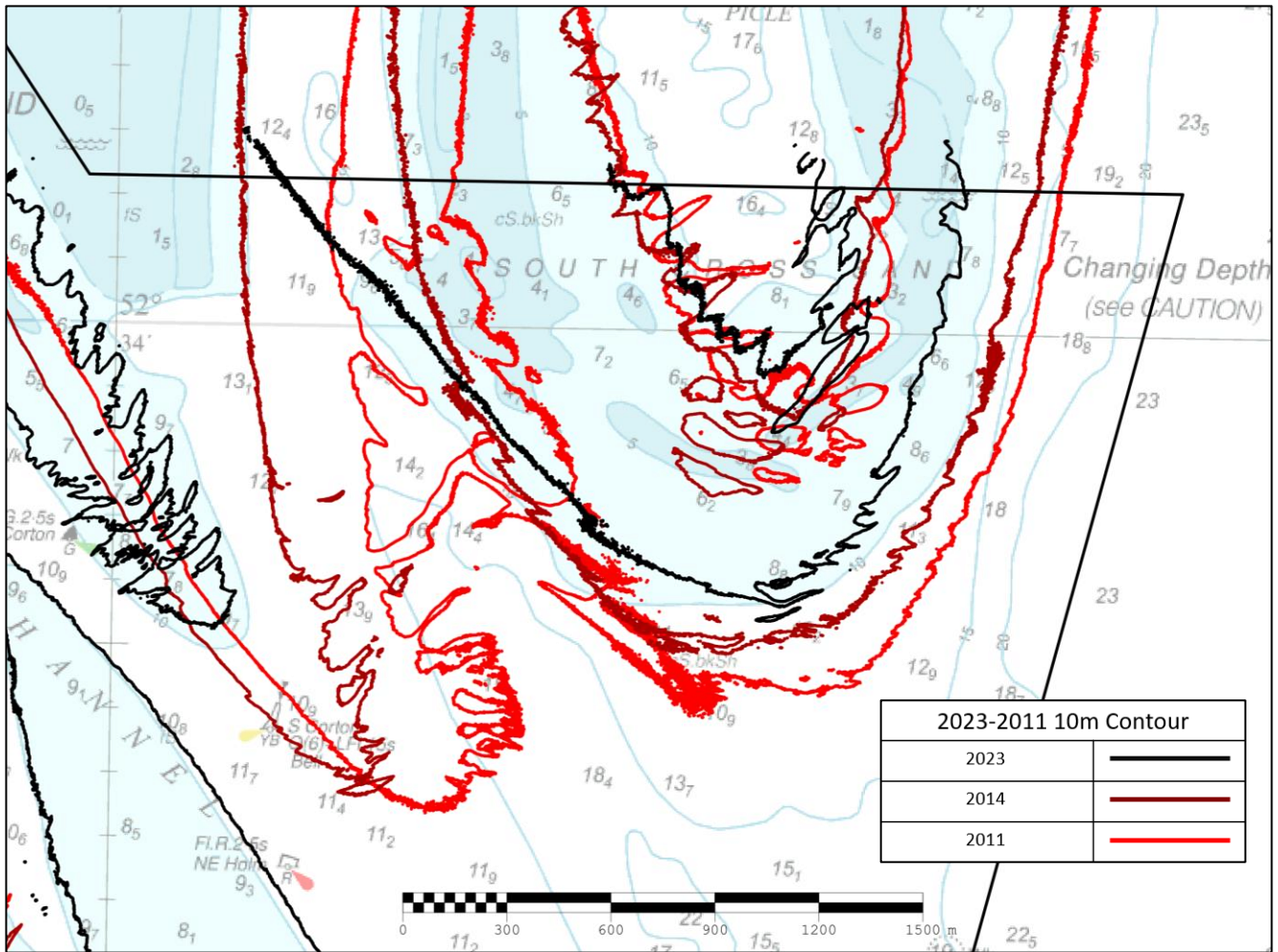


Figure 13: Contour plot showing changes in the 10m contours from 2011, 2014 and 2023 at South Cross Sands.



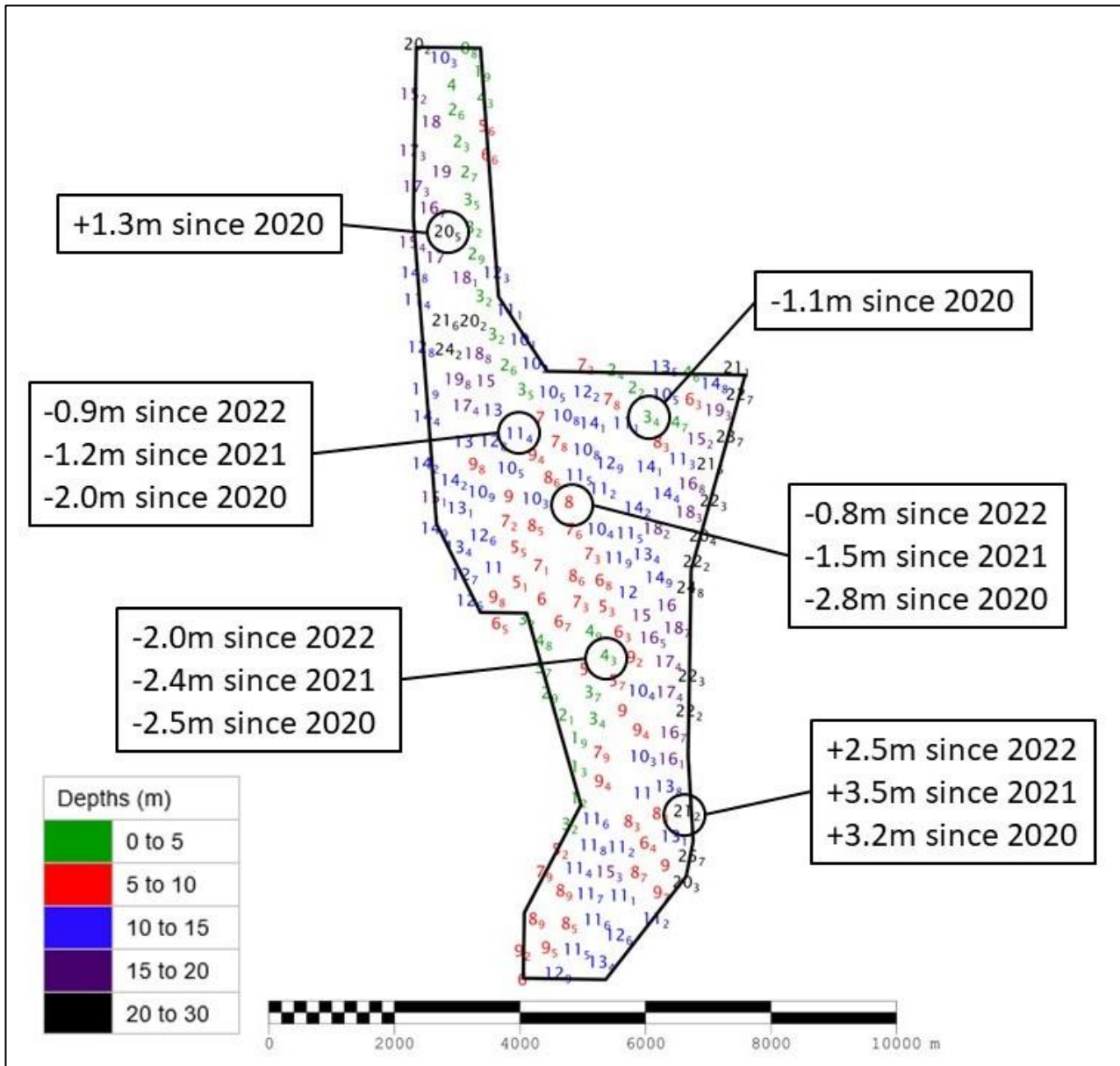


Figure 14: Colour banded depth plot from the 2023 survey with selected depth changes from selected surveys since 2020. Positive values (+) represent deepening. Negative values (-) represent shoaling.

## 6. RECOMMENDATIONS FOR FUTURE SURVEYS

### Survey Interval

- 6.1 Given the mobility and shoaling of the significant seabed features such as Holm, Corton and South Cross Sands, and South Scroby, the full EA9 area should remain on a 3-year survey interval, with the focused area surveyed annually.

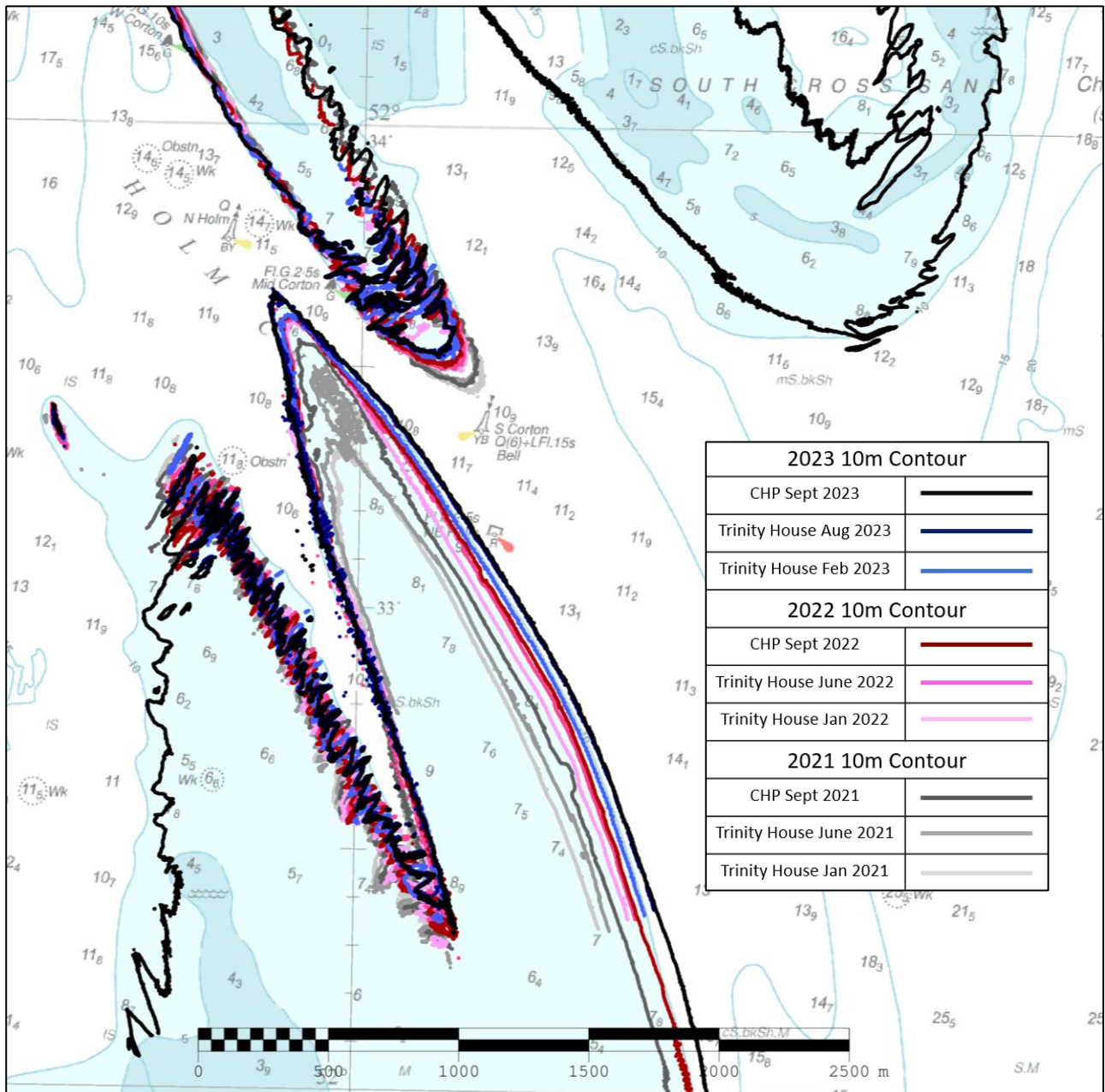
### Survey Area

- 6.2 The full area fully encompasses the mobility of the current seabed features of concern and is sufficient – the extra area surveyed around South Cross Sand should be maintained to monitor the movement N of this feature, with a possible review in ~3-4 years. The focused area will also be sufficient for the next survey; however, it may need reviewing after the 2024 surveys to see whether further areas of mobility warrant annual analysis.

## 7. APPENDICES

### 7.1 Appendix A

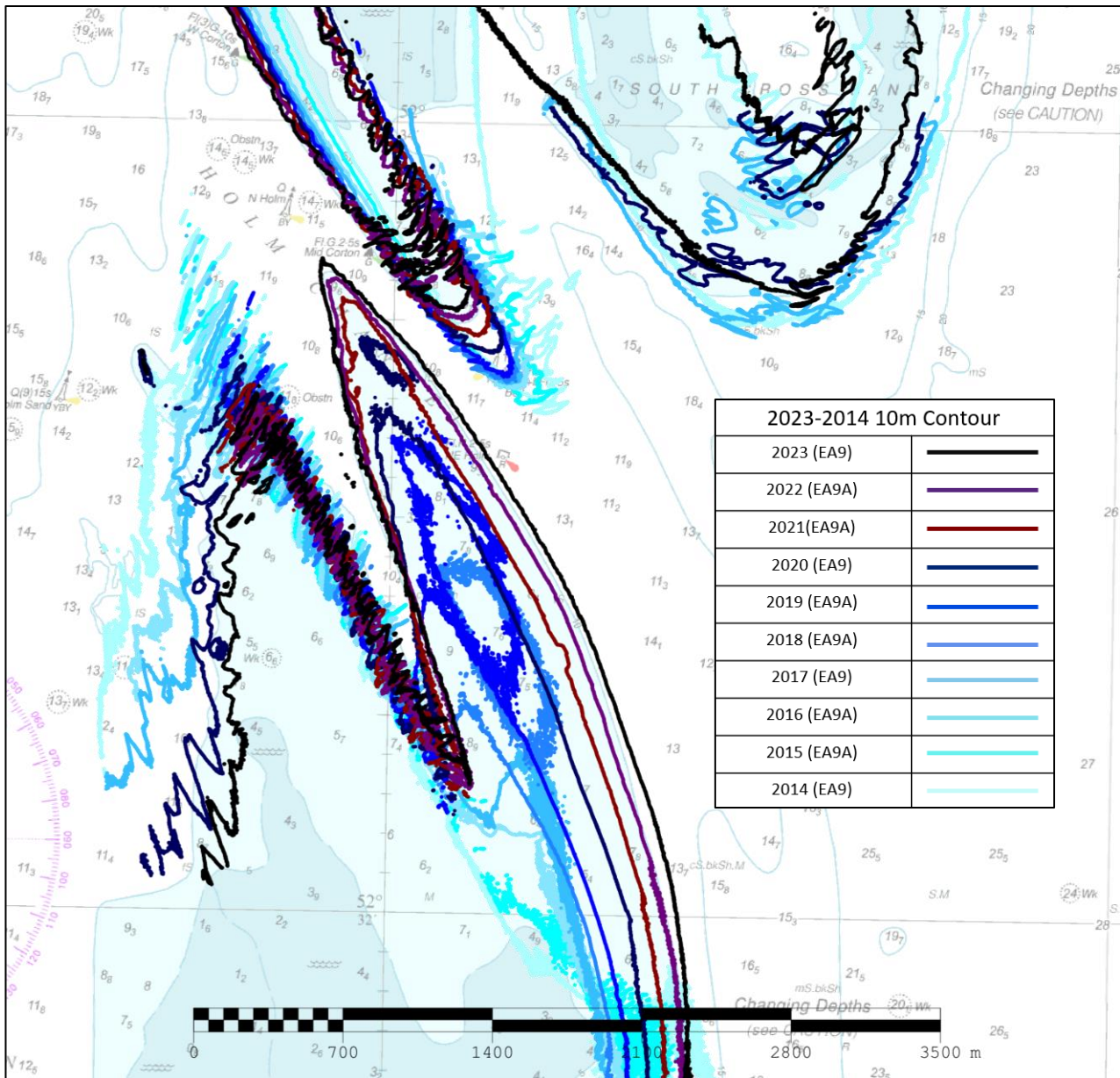
10m contour comparison of Holm Channel from the Civil Hydrographic Programme (CHP) and Trinity House surveys between 2021 and 2023.



The image above shows data from Trinity House data (CATZOC B, Order 2) alongside CHP surveys to provide an even more detailed analysis of the movement of the 10m contour in the last three years. A sustained movement NNW of the top of the top of Holm Channel can be seen, with the most change seen in a single year in 2021. The southern end of Corton Sand conversely is gradually retreating NNW. Holm Channel continues to be restricted to ~150m across at its narrowest between the 10m contours.

## 7.2 Appendix B

10m contour comparison of Holm Channel from the CHP EA9A and EA9 surveys between 2014 and 2023.



Appendix B shows the 10m contour over the last 10 years from CHP survey data. This allows for a longer-term trend analysis. The westward arm of Holm Sand is retreating SSE, whilst the Holm Channel section is advancing NNW. There are several years where a large jump can be seen in the Holm Channel arm 10m contour in a short space of time e.g., between 2020-2021 with a ~250m NNW movement from the isolated 10m contour patch, and 2019-2018 with a jump of ~650m NNW.

There has also been a significant expansion east of the seaward side of Holm Sand ~280m between 2018, when the 10m contour area of Holm Sand began to form, and 2023.