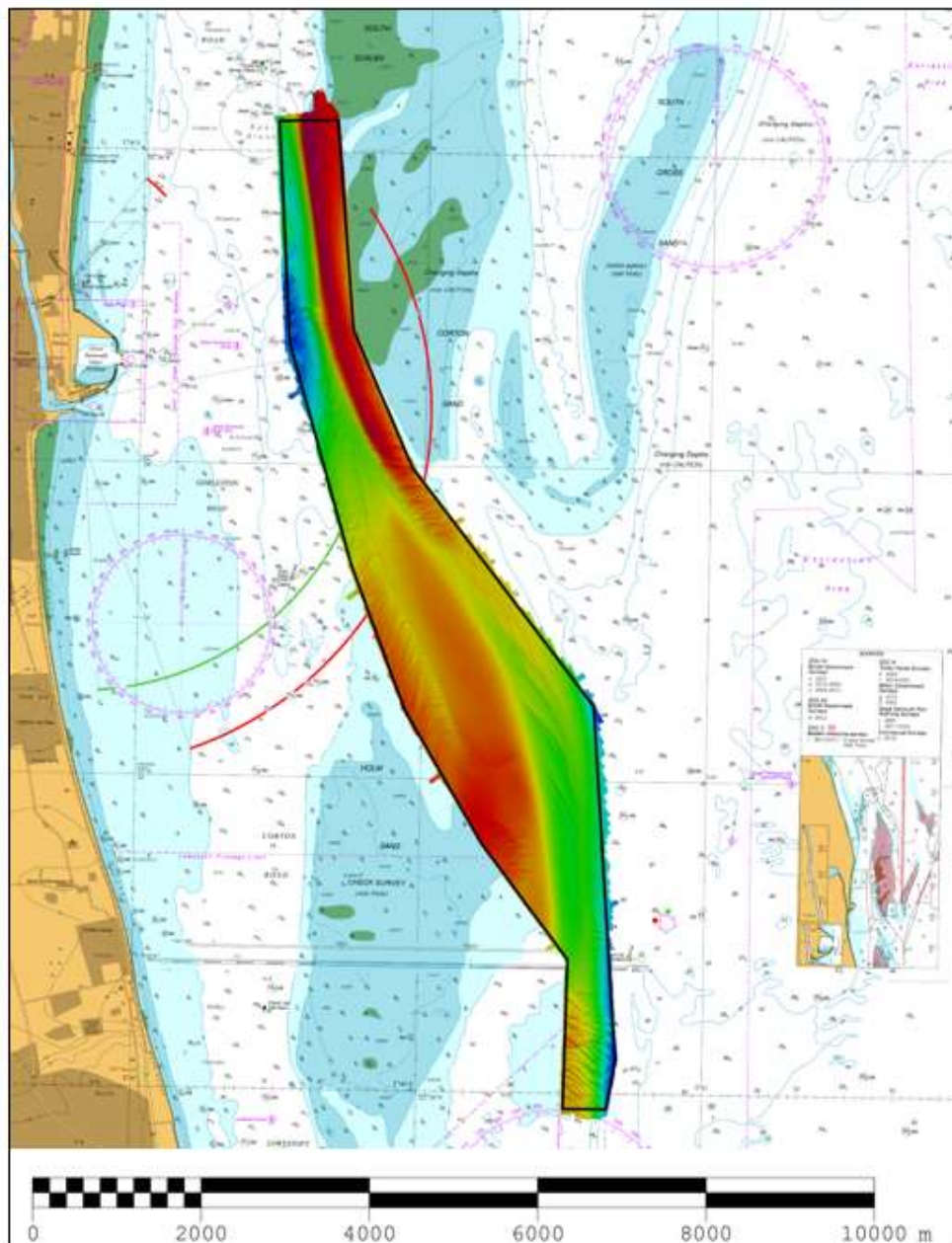




UK Hydrographic
Office

EAST ANGLIA EA9A - HOLM CHANNEL FOCUSED 2022 ASSESSMENT

An assessment of the 2022 hydrographic survey of the area EA9A: to monitor recent seabed movement; to identify any implications for shipping; and to make recommendations for future surveys.



CONTENTS

Notes	2
1. SUMMARY	1
2. LOCATION	1
3. REFERENCE SURVEY DETAIL	3
4. NEW SURVEY DETAIL	4
5. DESCRIPTION OF RECENT BATHYMETRIC CHANGE	4
6. RECOMMENDATIONS FOR FUTURE SURVEYS	11
7. APPENDIXES	12-13

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.

HOLM CHANNEL FOCUSED, 2022

1. SUMMARY

Changes Detected

- 1.1 The 2022 EA9A survey identified migration of several sandbanks in the survey area of Holm Channel. Areas with significant sandbank migration include: a westward migration of Corton Sand and South Scroby and a north-eastwards migration of Holm Sand into Holm Channel.
- 1.2 Depths in the area remain highly changeable, seen by the movement of the 10m contours of the northern end of Holm Sands.
- 1.3 The controlling depth was found to be 10.7m (-0.1m since 2021 at that position) between the NE Holm and S Corton buoys entering Holm Channel. Another significant depth of 10.3m has also been highlighted in the narrow navigable area of Holm Channel, as the original shoal depth (of 9.4m in 2021) has been swallowed up by the 10m contour zone.

Reasons for Continuing to Resurvey the Area

- 1.4 The highly mobile seabed of Holm Channel continues to migrate north-eastwards into the Deep Water Route (DWR) of Holm Channel and therefore requires continued monitoring through annual resurveys.

Recommendations

- 1.5 Given the migration of the sandbanks surrounding Holm Channel, EA9A should remain on an annual focused survey, with EA9 on a 3-year full survey interval.
- 1.6 The EA9A survey limit will retain its current extent due to the next Routine Resurvey being a full survey conducted in 2023. The annual focused survey limit will be reevaluated following the full survey in 2023.

2. LOCATION

- 2.1 Survey interval at time of resurvey: an annual focused survey and a full survey conducted in 3-year intervals.
- 2.2 Area Covered: 13.41 km²

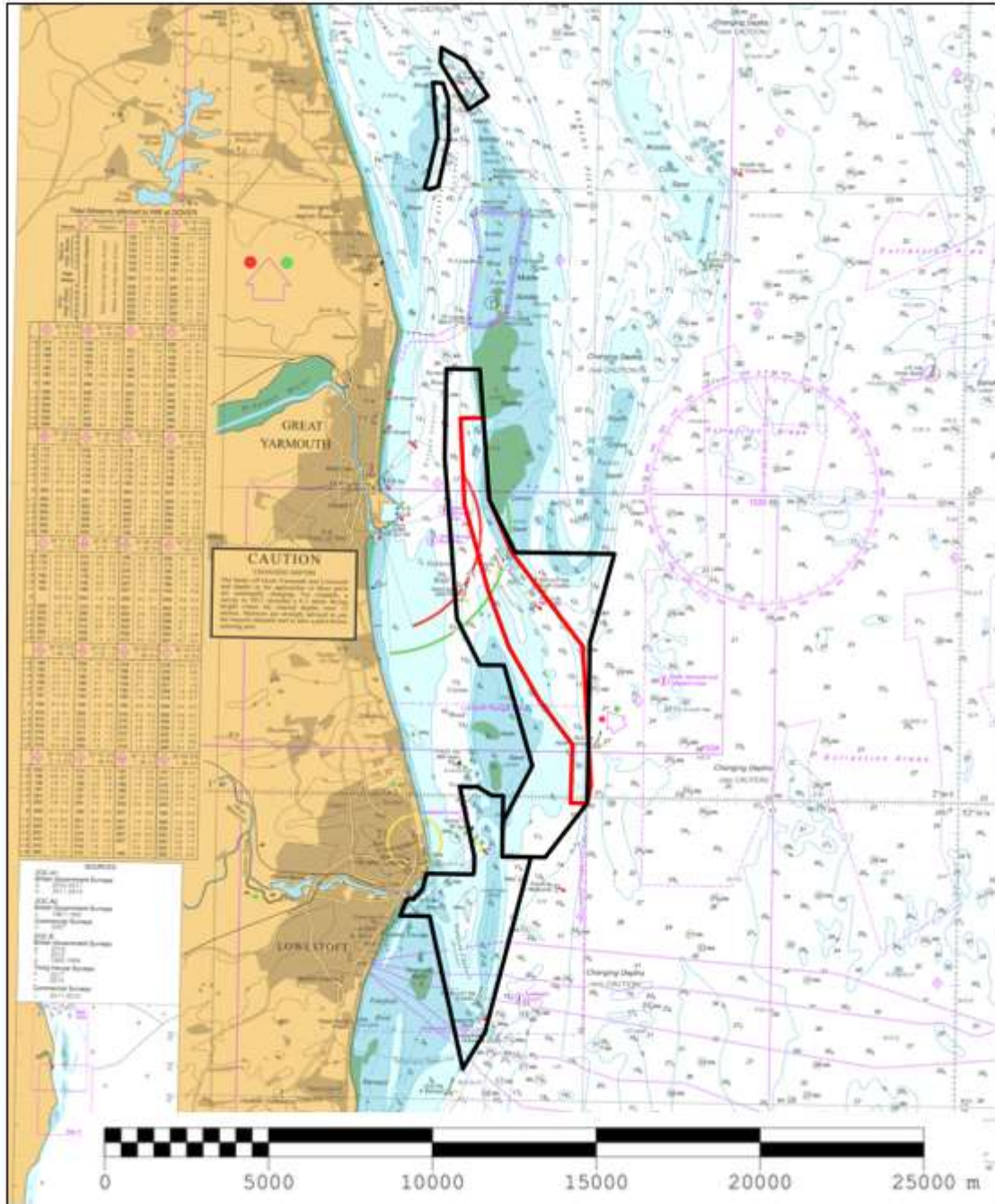


Figure 1: 2022 East Anglia Routine Resurvey areas overlaid on BA Chart 1543 with area EA9A in red.

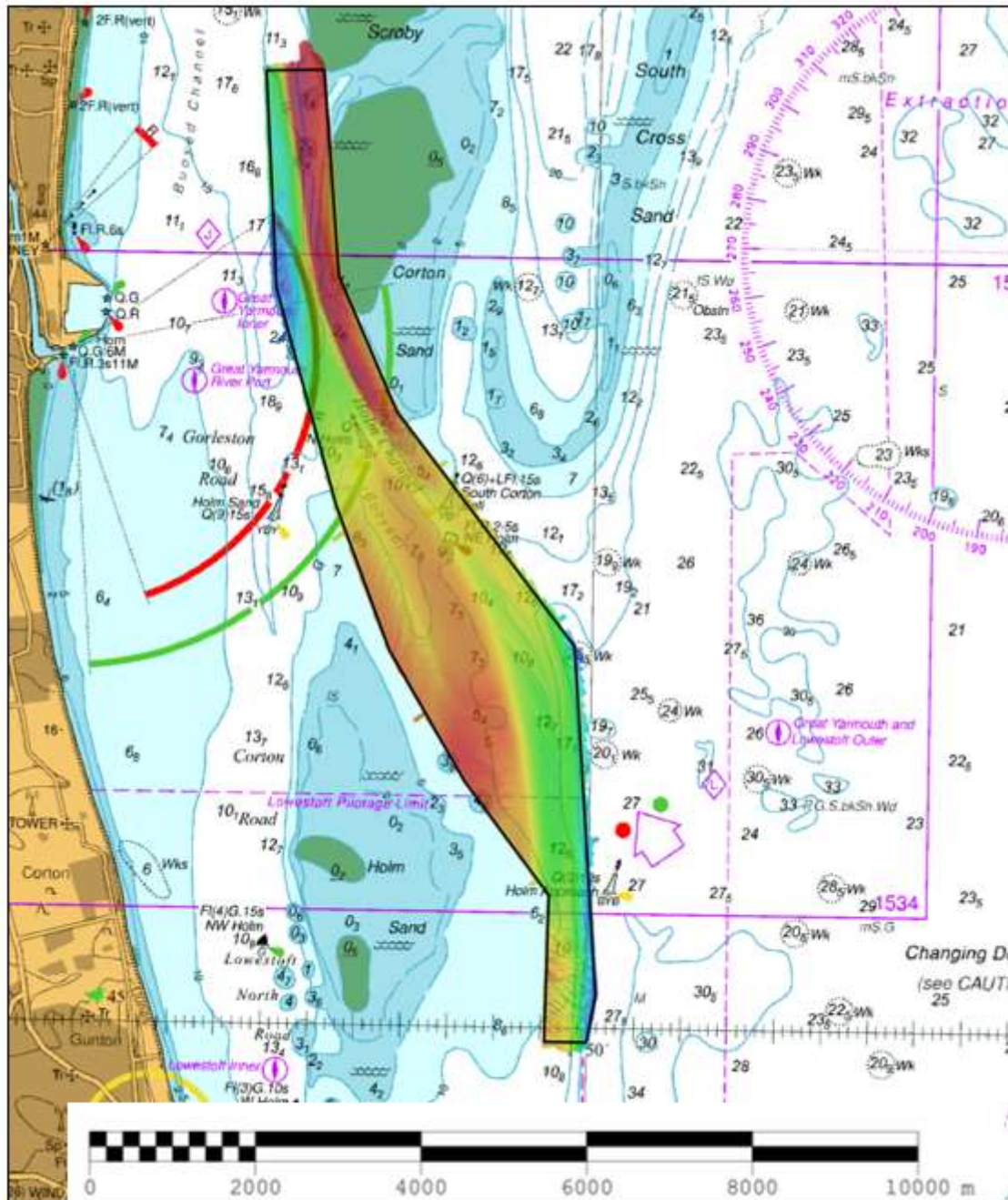


Figure 2: 2022 survey data overlaid on BA Chart 1543.

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 HI1737. The previous full survey was undertaken as part of the 2020 Routine Resurvey Programme in October 2020 as part of HI1687.

- 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 was conducted in September 2022 as part of HI1761.
- 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 2022 survey is 10.7m in the approach to Holm channel between the NE Holm and S Corton buoys. The navigation channel itself has constricted since 2021 (and is currently ~200m in width). This is due to the encroaching Holm Sand, with the 10m contour advancing ~90m NW, encompassing the isolated 9.4m shoal depth seen in 2021. Therefore, for this area between the N Holm and Mid Corton buoys the depth 10.3m has been highlighted as another significant depth to consider within the channel. The controlling depth migration highlights the narrowing of Holm Channel which is. Therefore, the DWR in Holm Channel continues to narrow and shoal.
- 5.2 The difference surface in Figure 4 shows the depth difference between the 2022 and 2021 survey. Figure 5 shows the depth difference between the 2022 and 2020 survey. These figures highlight the continued shoaling and westward migration of Corton Sand and South Scroby into Yarmouth Road. Furthermore, Figures 4 and 5 show a significant north-eastwards migration of Holm Sand migrating into Holm Channel.
- 5.3 The contour plot in Figure 6 shows the 5m depth contours and Figure 7 shows the 10m contours from 2022, 2021 and 2020. These figures highlight the sandbank migration as previously discussed in subsection 5.2. Figure 6 shows that the 5m contour located in the northern extent of the survey area has migrated westwards by 75m since the 2021 survey. Figure 7 shows that the 10m contour located in the northern extent of the survey has migrated westwards by 90m since the 2021 survey. Moreover, the 10m contour located adjacent to Holm Channel has migrated 90m north-eastwards since the 2021 survey. See Appendix A and B for further analysis of contour changes in Holm Channel.
- 5.4 Figure 8 shows a colour banded sounding selection of the 2022 survey. Significant depth differences have been highlighted between the 2021 and 2020 surveys. Figure 8 shows areas of shoaling and deepening consistent with a highly mobile seabed.

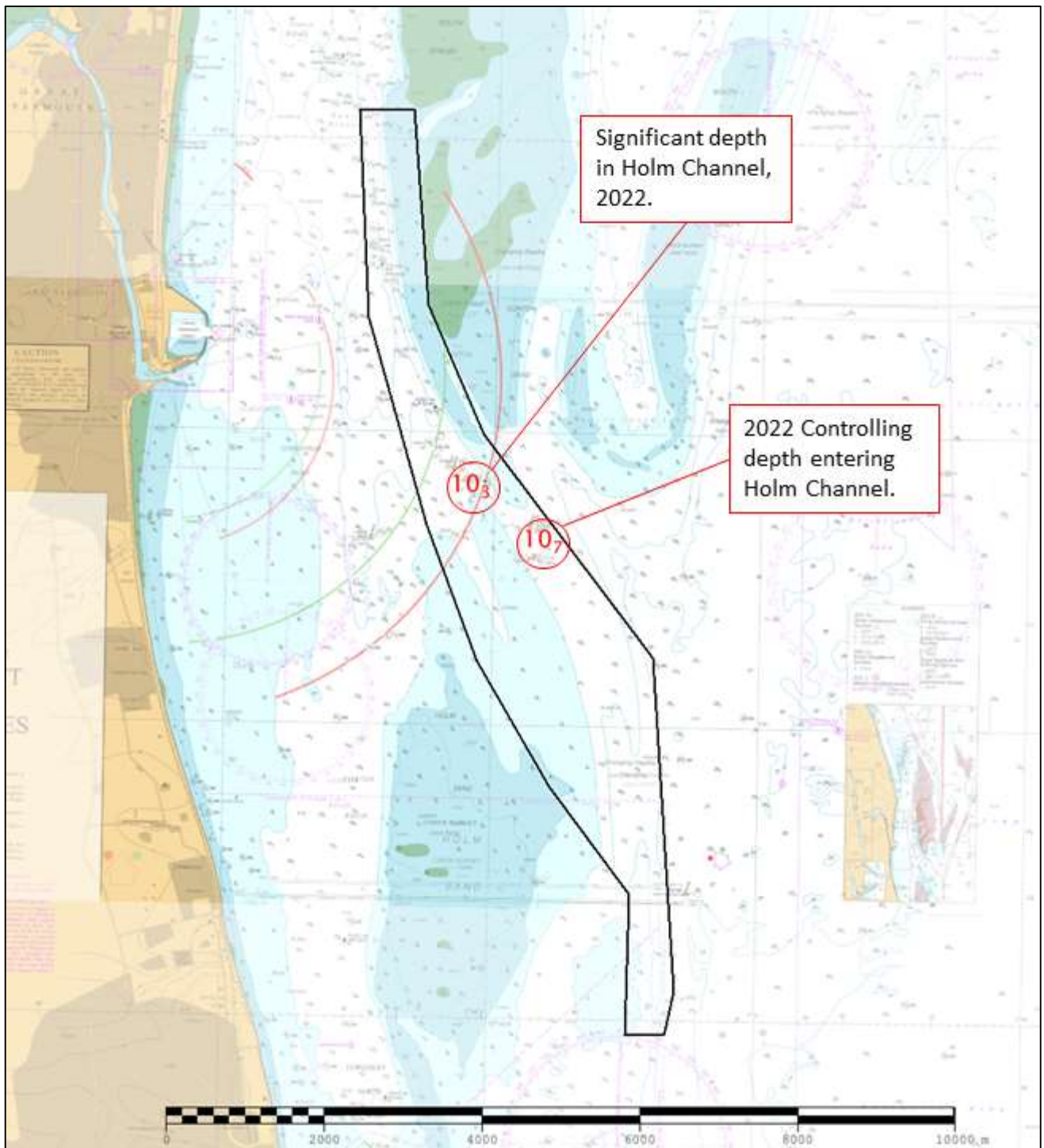


Figure 3: Controlling and significant depth soundings highlighted, overlaid on BA Charts 1534 and 1535.

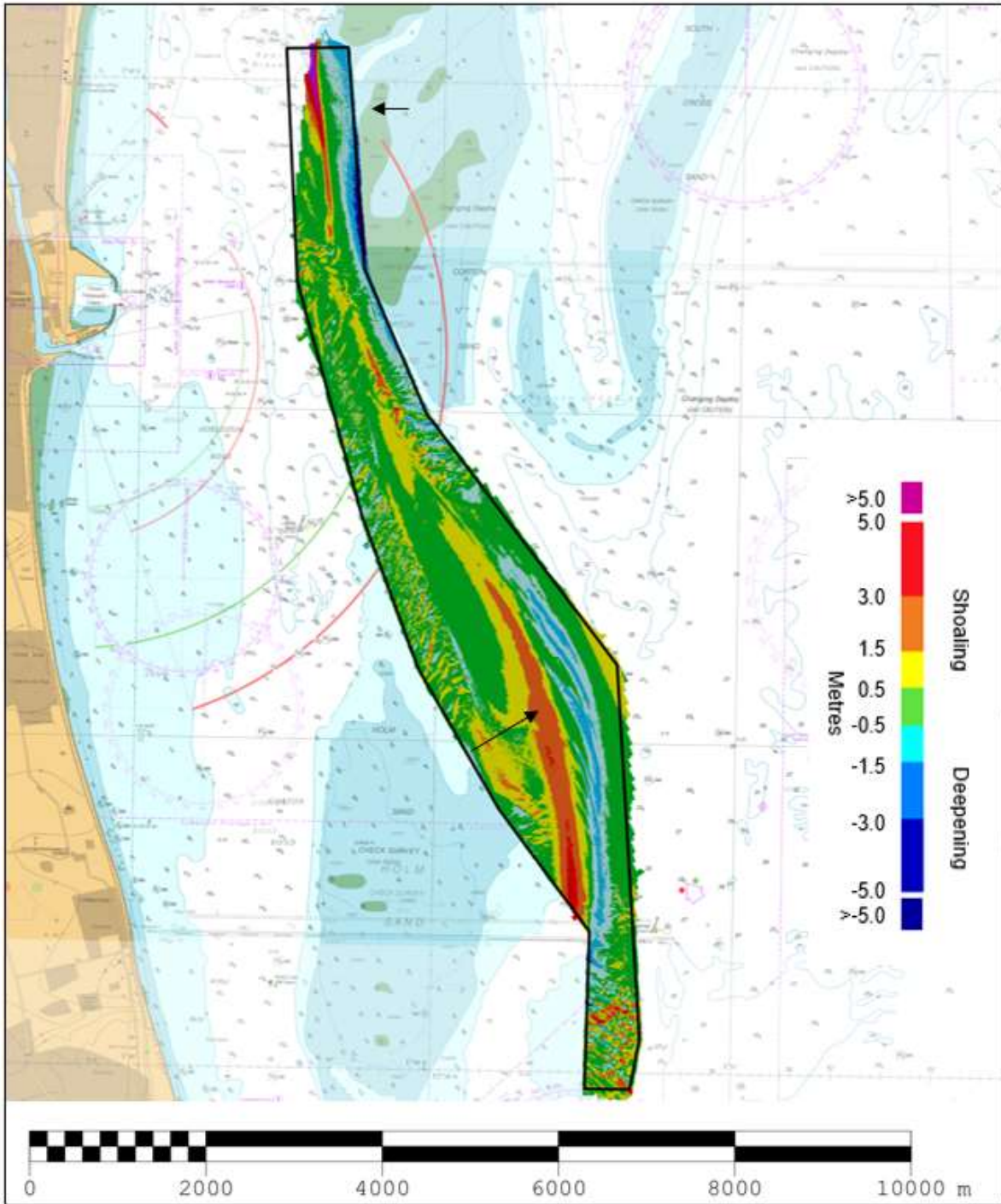


Figure 4: Difference surface showing bathymetric changes between the 2022 and 2021 surveys overlaid on BA Charts 1534 and 1535 (Black arrows represent sandwave migration since 2021 survey)

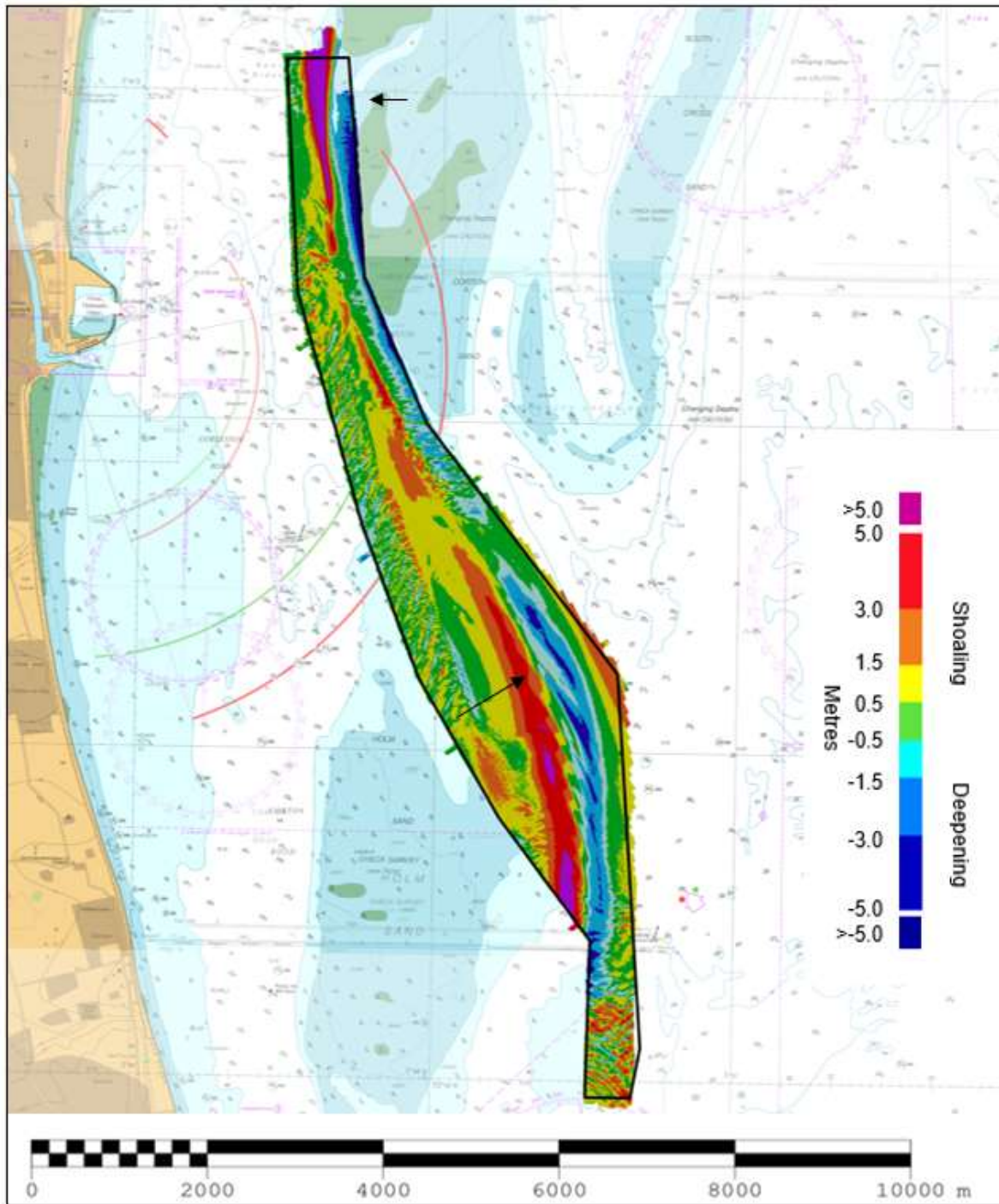


Figure 5: Difference surface showing bathymetric changes between the 2022 and 2020 surveys overlaid on BA Charts 1534 and 1535 (Black arrows represent sandwave migration since 2020 survey)

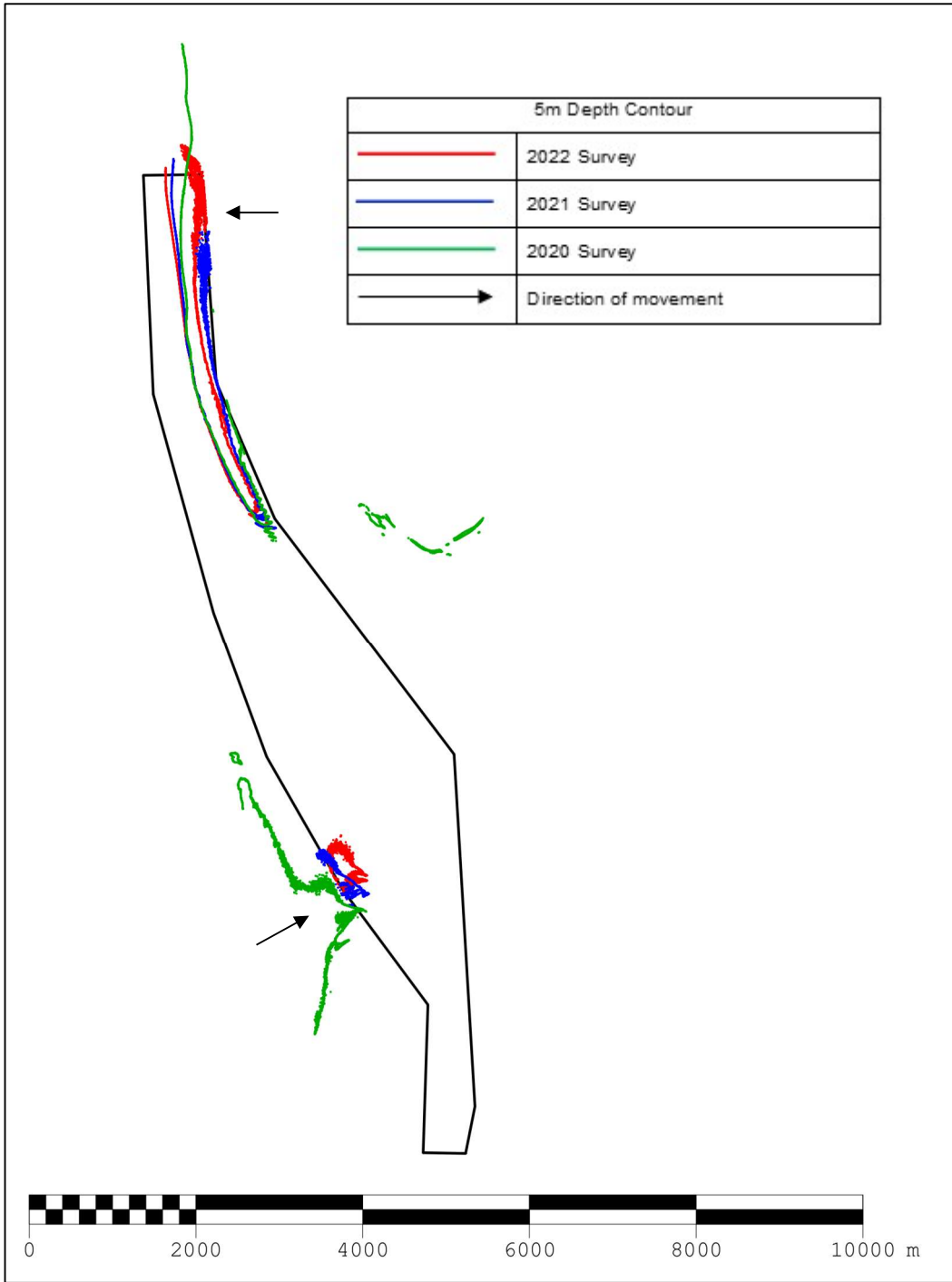


Figure 6: Contour plot showing changes in the 5m contours between 2022 (red), 2021 (blue) and 2020 (green). Black arrow represents feature migration.

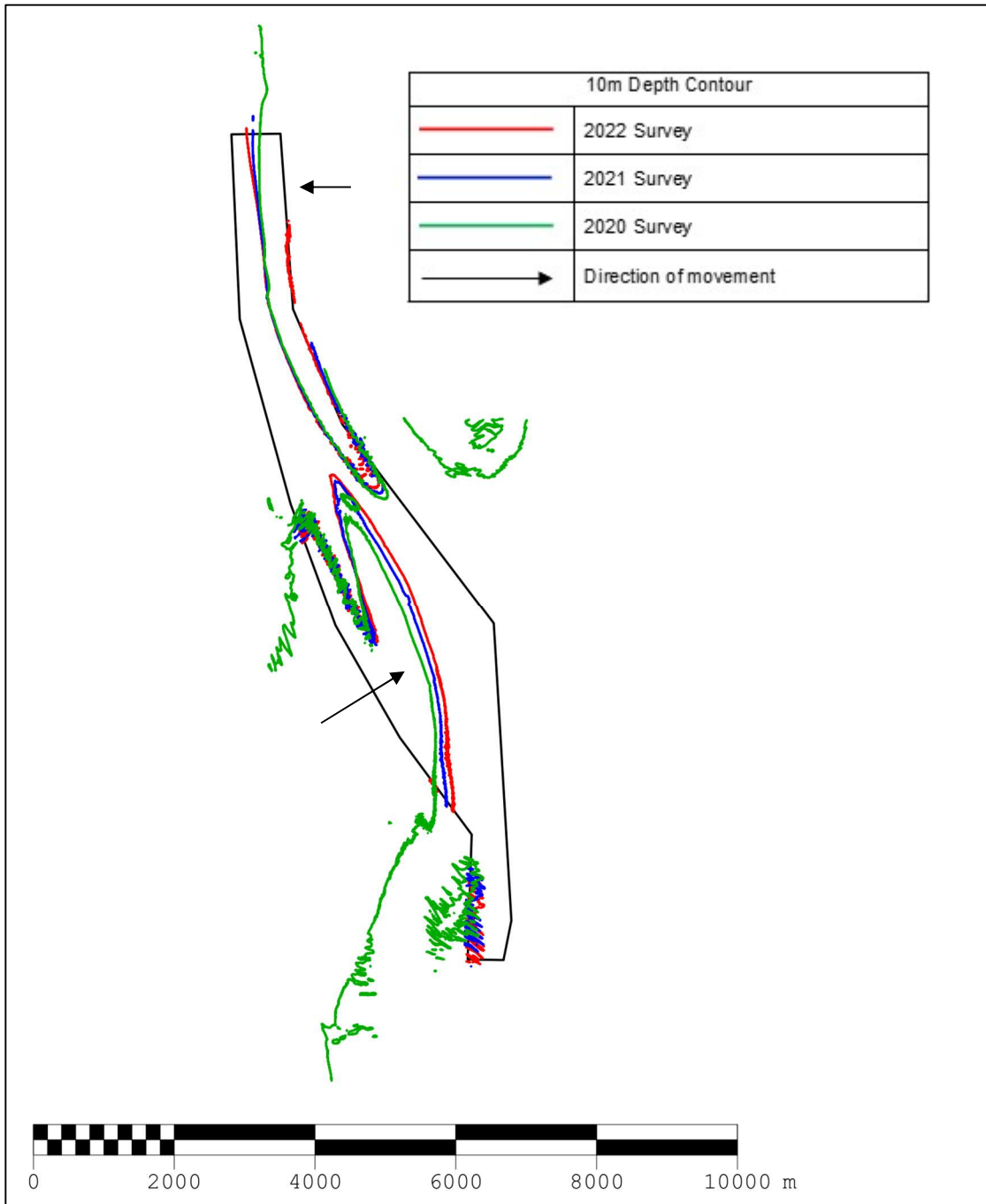


Figure 7: Contour plot showing changes in the 10m contours between 2022 (red), 2021 (blue) and 2020 (green). Black arrow represents feature migration.

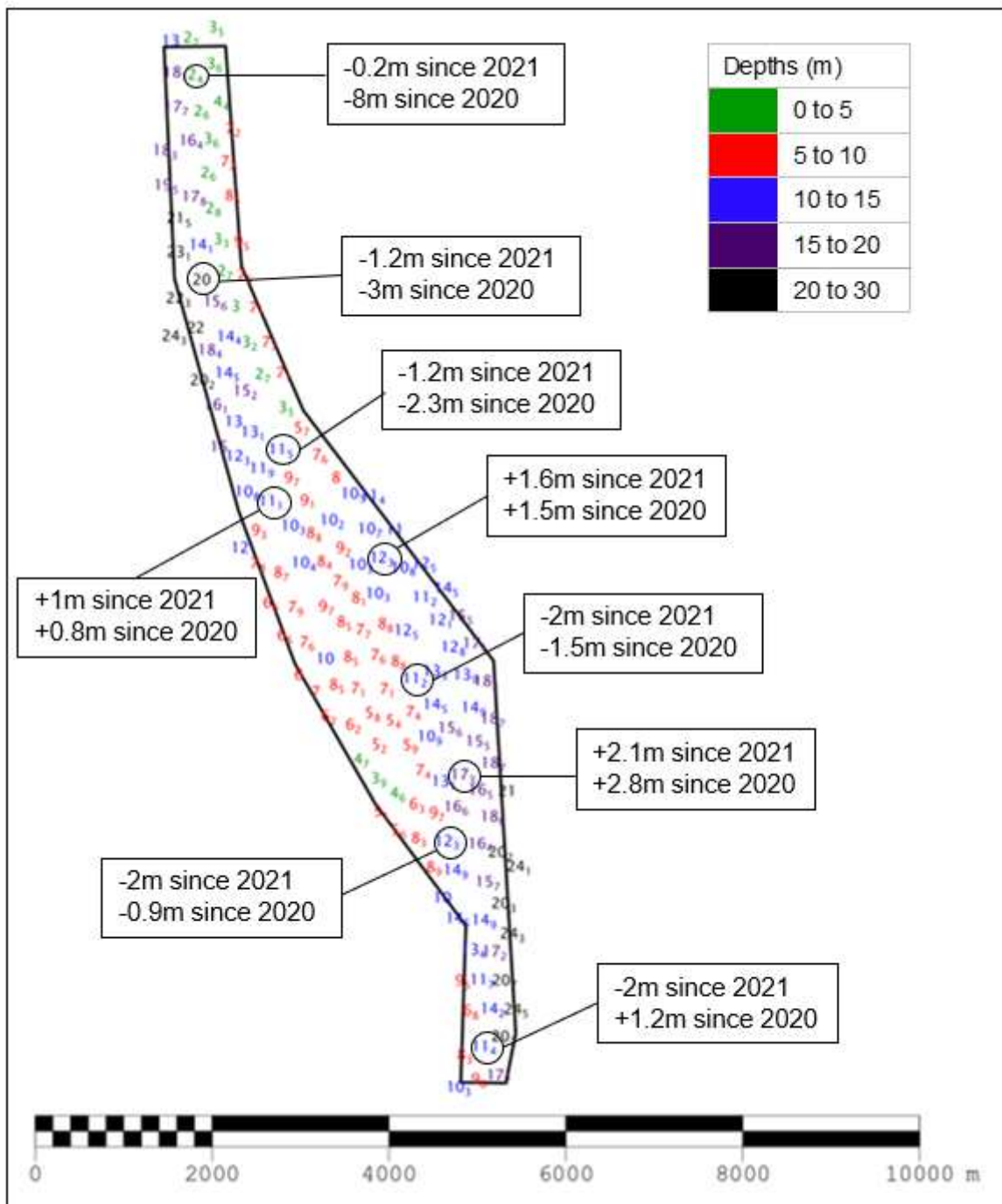


Figure 8: Colour banded depth plot from the 2022 survey with selected depth changes since the 2021 and 2020 surveys. Positive values (+) represent deepening. Negative values (-) represent shoaling.

6. RECOMMENDATIONS FOR FUTURE SURVEYS

Survey Interval

6.1 Given the continued sandbank migration surrounding Holm Channel, EA9A should remain on an annual focused survey, with EA9 on a 3-year full survey interval.

Survey Area

6.2 As discussed in subsection 1.4, the focused survey area limit will be reevaluated after the next full survey which is to be conducted in 2023. The full survey area limit has been adjusted to include the southeast area of the focused survey which extended outside of the full survey area.

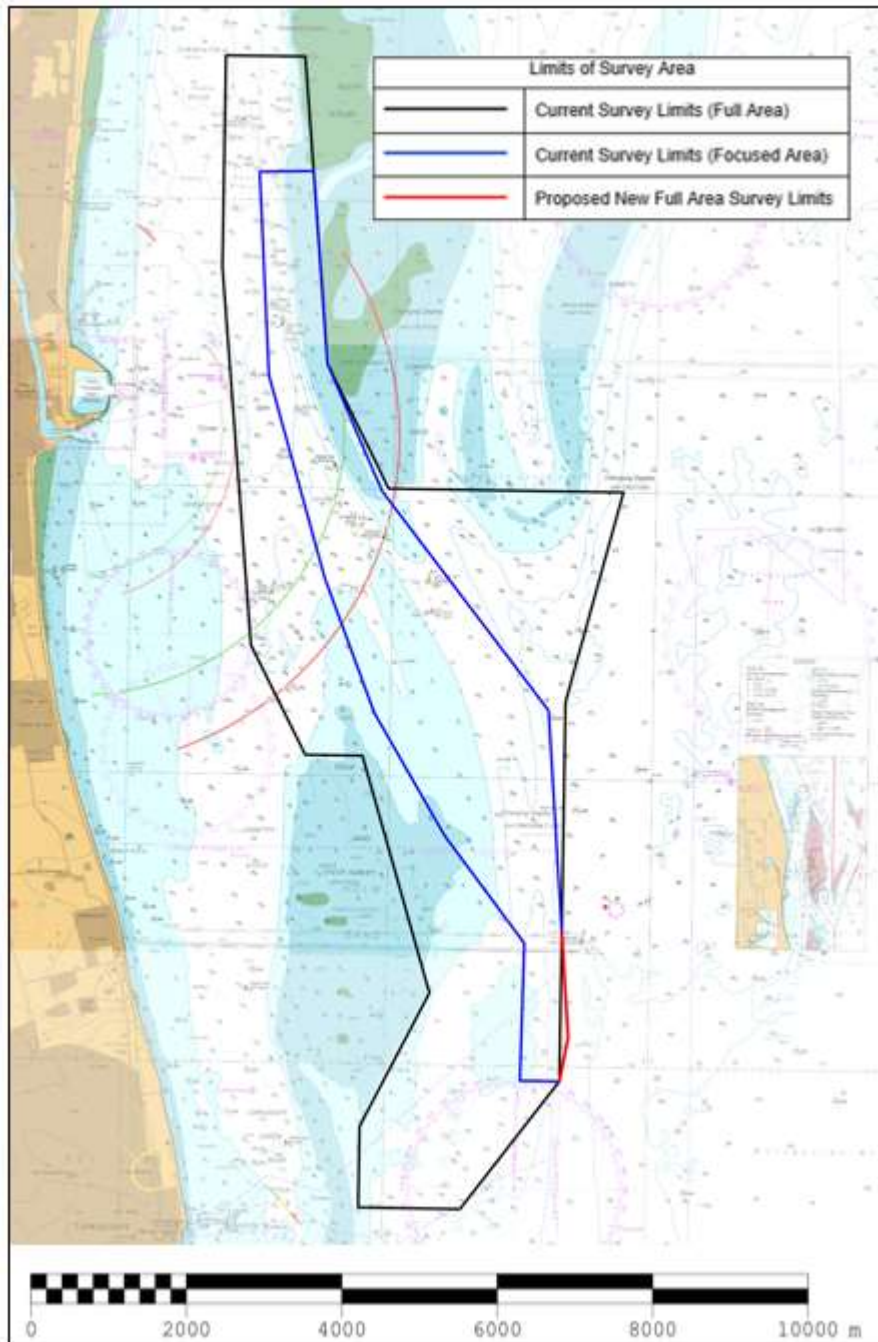


Figure 9: Survey limits of area EA9A.

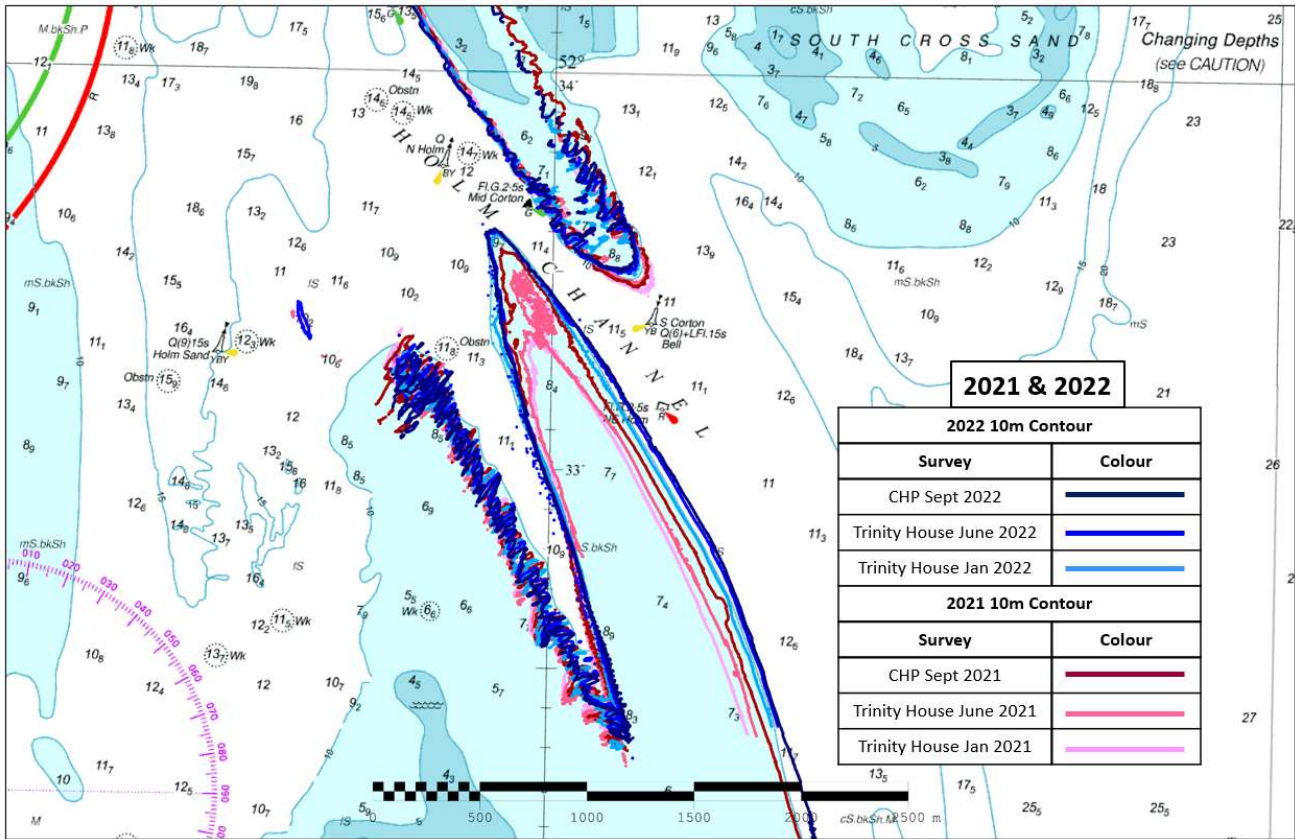
The coordinates of the recommended adjusted survey area limits for the full survey area EA9 are shown below:

EA9 total area: 33.93 km²

Point	Latitude	Longitude
1	52.616715N	001.781795E
2	52.581080N	001.787000E
3	52.566750N	001.799025E
4	52.566750N	001.843730E
5	52.542330N	001.833330E
6	52.515620N	001.833335E
7	52.503405N	001.834845E
8	52.498330N	001.833330E
9	52.483330N	001.814830E
10	52.483330N	001.795500E
11	52.492745N	001.795500E
12	52.508335N	001.808360E
13	52.535735N	001.794885E
14	52.535720N	001.784010E
15	52.548330N	001.773330E
16	52.592170N	001.766670E
17	52.616670N	001.766670E

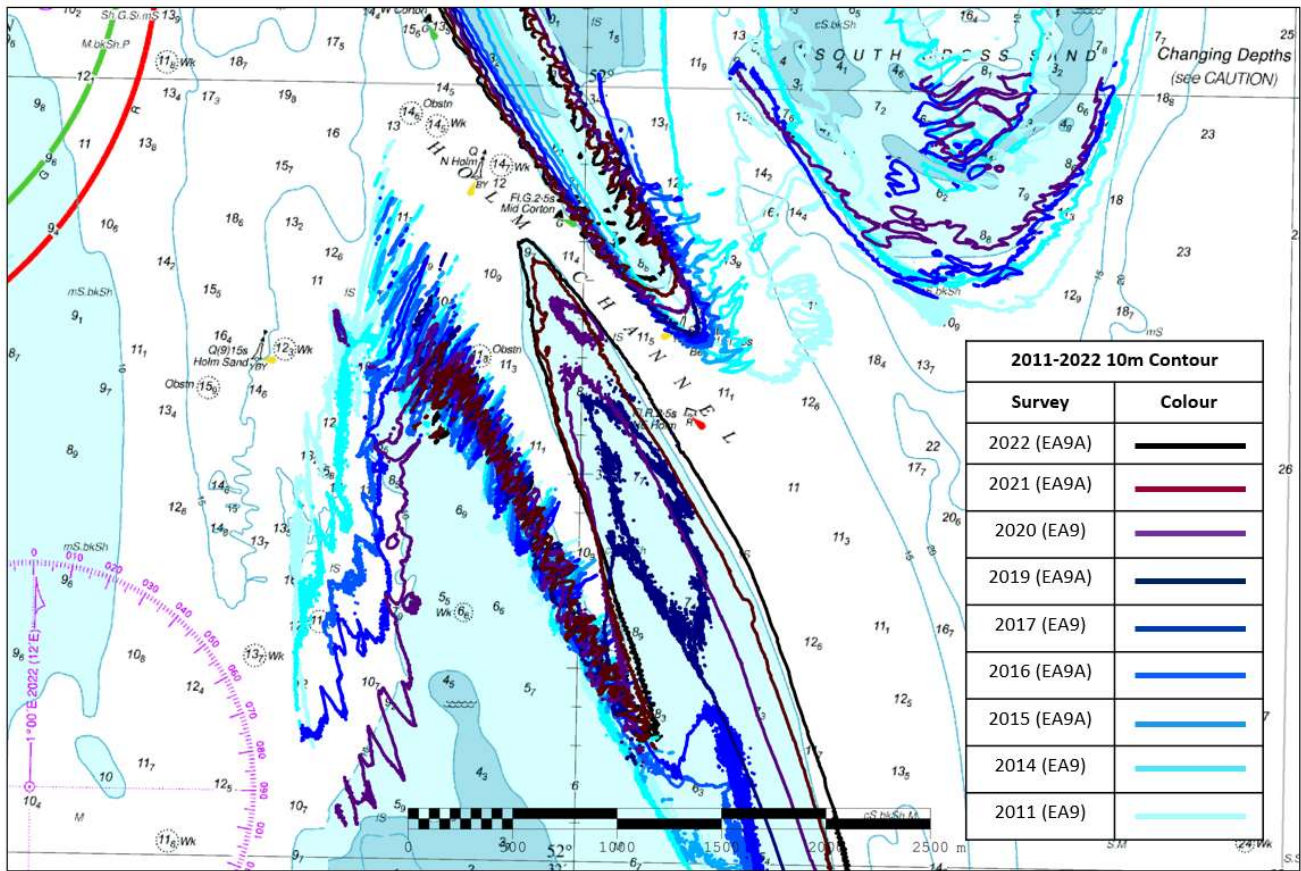
7. APPENDICES

Appendix A: 10m contour comparison of Holm Channel from the Civil Hydrographic Programme (CHP) and Trinity House surveys between 2021 and 2022.



Appendix A shows the difference in the location of the 10m contour between the annual CHP and bi-annual Trinity House surveys between 2021 and 2022. The 2021 CHP survey locates the southern tip of the Holm Sand sandbank 200m northwest of the June 2021 Trinity House 10m contour. This discrepancy is due to the coarser resolution of survey data provided by the Order 2 CATZOC B Trinity House survey, in comparison to the Order 1A CATZOC A1 CHP 2021 survey. The difference in the 2022 10m contour from the CHP and Trinity House surveys is marginal. The 2022 CHP survey locates the 10m contour along the south-eastern Holm Channel sandbank 14m southeast of the June 2022 Trinity House survey. However, it is important to note that this area of seabed is highly mobile and susceptible to frequent change and that the CHP and Trinity House surveys are conducted at different intervals each year.

Appendix B: 10m contour comparison of Holm Channel from the CHP EA9A and EA9 surveys between 2011 and 2022.



Appendix B shows contour migration between 2011 and 2022 for both the focused EA9A and full EA9 CHP surveys. The most significant changes in the location of the 10m contour are between the 2020 and 2021 surveys. The southern tip of the Holm Channel sandbank has migrated 200m northwest between the 2020 and 2021 surveys. Additionally, the northern Holm Channel sandbank has migrated northwest by 400m between 2014 and 2021. Similarly, the southern tip of the Holm Channel sandbank has migrated 90m northwest between the 2021 and 2022 surveys, as discussed in subsection 5.3. These changes emphasise the narrowing of Holm Channel over the last 11 years.