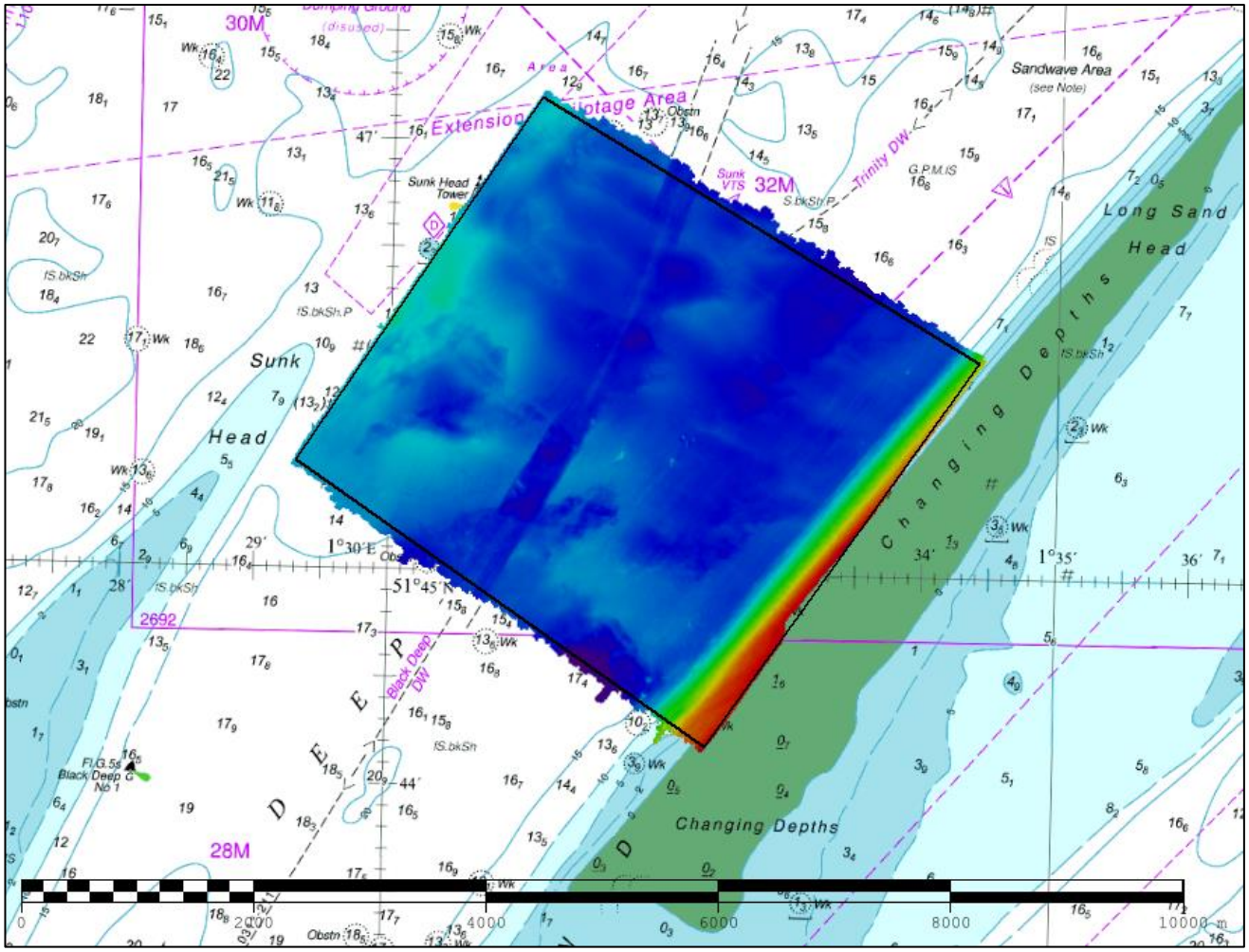
UK Hydrographic Office

Maritime & Coastguard Agency

THAMES ESTUARY
BLACK DEEP FULL (TE6)
2020 ASSESSMENT

An assessment of the 2020 hydrographic survey of the area TE6: 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).

The Admiralty Chart extracts, other graphics and tables in this Report are included for illustrative purposes only and are NOT TO BE USED FOR NAVIGATION.

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

BLACK DEEP FULL, 2020

1. SUMMARY

Changes Detected

1.1 Much of the TE6 area has remained unchanged and stable since 2008, with the exception of the Black Water Deep Water Route (DWR) which was dredged in 2016.

1.2 The Black Water DWR has two controlling depths within the channel that have shoaled from the 2016 focused survey shoalest depths (TE6a), by 0.5m and 0.4m.

1.3 Long Sand bank has been steadily migrating east/southeast since the 2008 survey, away from the Black Deep DWR.

Reasons for Continuing to Resurvey the Area

1.4 Depths in the area remain of significant importance to deep draught vessels navigating the DWR channel but are mostly stable. Therefore, continued monitoring through 12-yearly resurveys is required.

Recommendations

1.5 Due to the stability of the area, it is suggested that the full TE6 area should remain on the 12-year survey interval, but a 6-yearly focused survey of the Black Deep DWR be reinstated to monitor seabed changes for deeper draught vessels.

1.6 Current RRS limits for TE6 are sufficient for monitoring the area, and therefore do not require extending.

2. LOCATION

2.1 Survey interval at time of resurvey: 12 years

2.2 Area Covered: 18.01 km^2

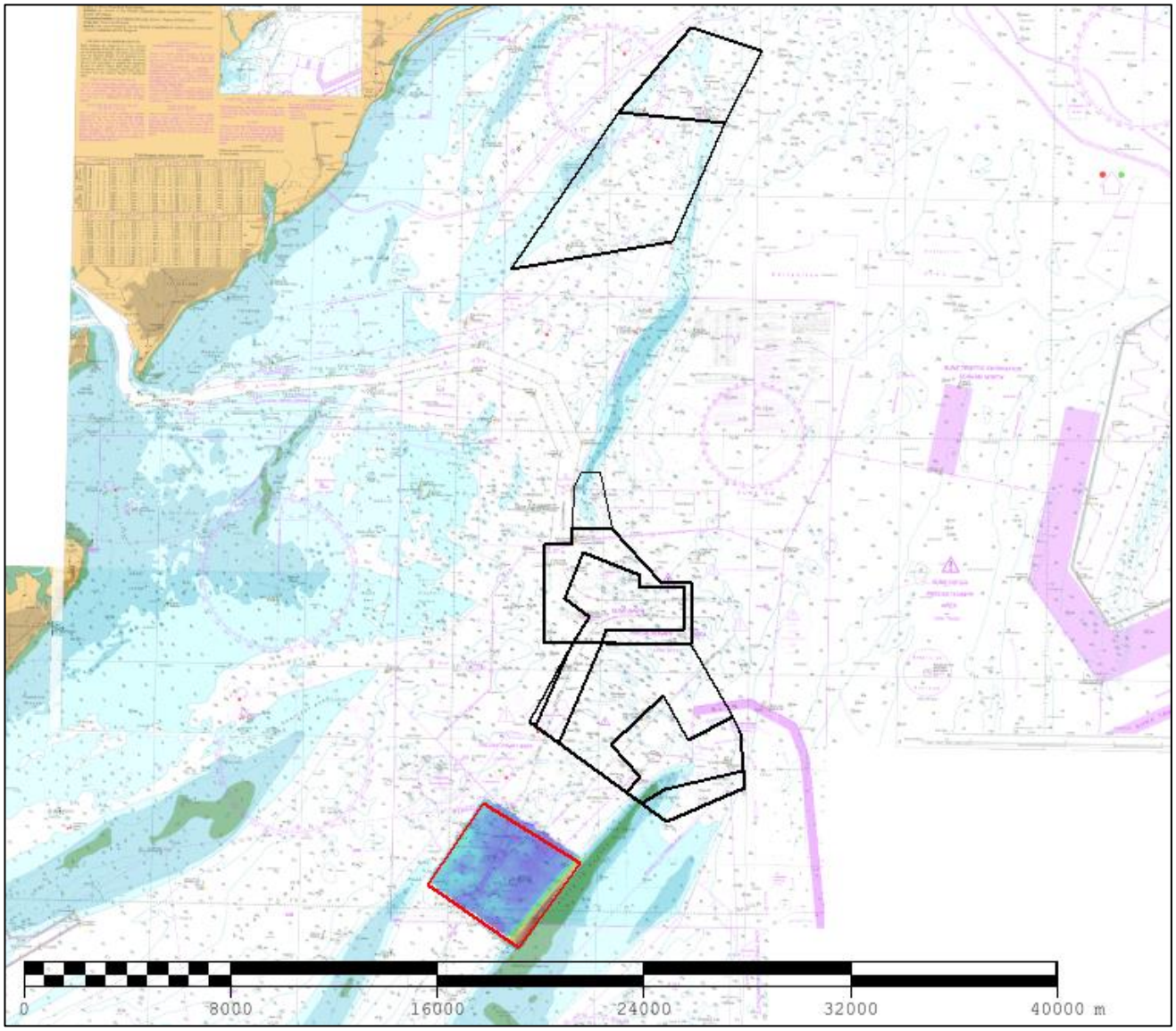

Figure 1: 2020 north section of Thames Estuary Routine Resurvey areas overlaid on BA Charts 1975-0 and 2052-0 and with area TE6 in red.

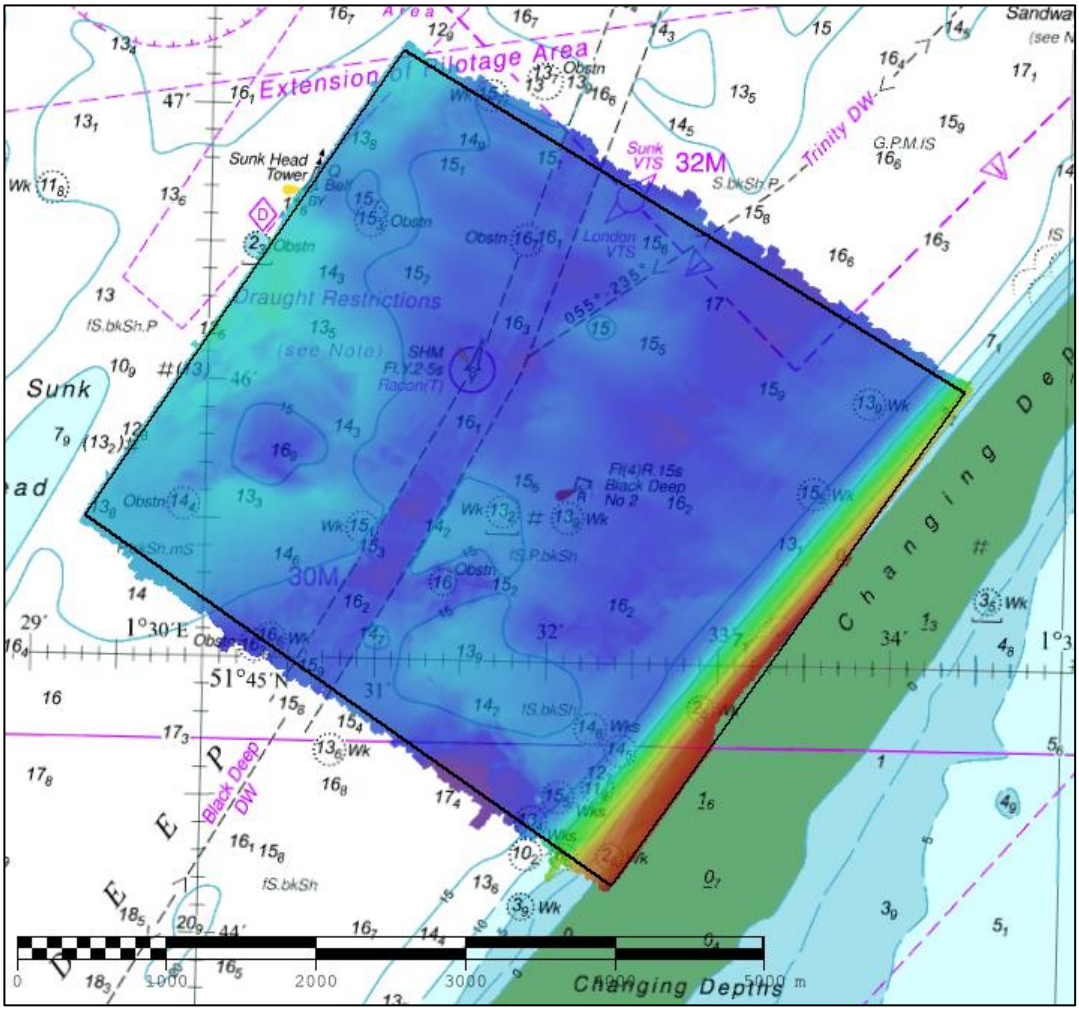

Figure 2: 2020 survey data overlaid on BA Chart 1975-0.

3. REFERENCE SURVEY DETAIL

3.1 The previous full survey was conducted within the 2008 Routine Resurvey Programme between June and September 2008 as part of HI1267. Another full survey was conducted within the Routine Resurvey Programme between July and August 2005 as part of HI1118. A focused survey of the Black Deep DWR was conducted between July and October 2016 after the channel was dredged, as part of HI1522.

3.2 The Report of Survey for these surveys are 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 full survey from the 2020 Routine Resurvey Programme was conducted between August and September 2020 as part of HI1693.

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 The majority of the seabed changes over the last 12 years has been in the DWR channel (which was dredged in 2016), and in the gradual migration of Long Sand in an east/southeast direction. This can be seen in Figures 4-5,

5.2 In Figure 3, TE6 was split into 4 sections to mark where the controlling depths are currently located in areas of significance, and how much they have changed since previous surveys.

5.3 In the Black Deep DWR channel, the two shoalest soundings have been highlighted in Figure 3, showing that the controlling depths are between 0.5m and 0.4m shoaler than in the 2016 survey post-dredge. In contrast, areas 1 and 4, where vessels with smaller draughts may be required to wait, show little change since 2005 and 2008. This is also seen in Figures 4-6.

5.4 Within the DWR, larger changes seen of +/-0.9m shown by the difference image in Figure 5 are typically due to SW migration of ripples within the channel.

5.5 The contour plot in Figure 6 shows that (besides the channel, dredged in 2016), most change can be seen around Long Sand, which has steadily been migrating east/southeast since 2008.

5.6 The colour banded depth plot in Figure 7 also shows very little change since the 2008 survey outside the DWR channel and Long Sand.

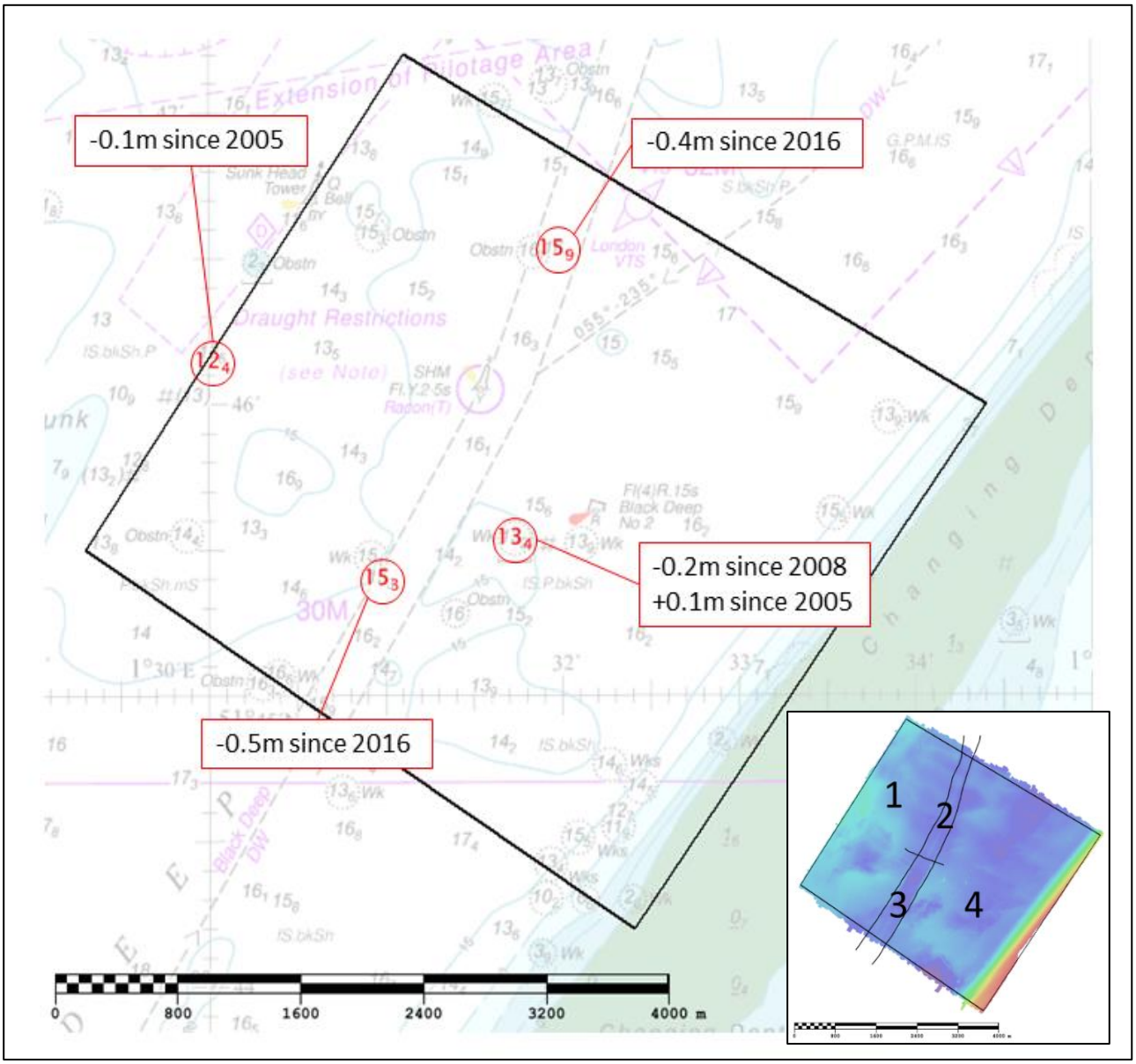

Figure 3: Controlling Depths – split between 4 main areas of the survey to include DW routes as indicated by panel in bottom right. Change is shown since previous surveys (2005, 2008 or 2016.)

Positive values (+) represent deepening. Negative values (-) represent shoaling. Shown on BA Chart 1975-0.

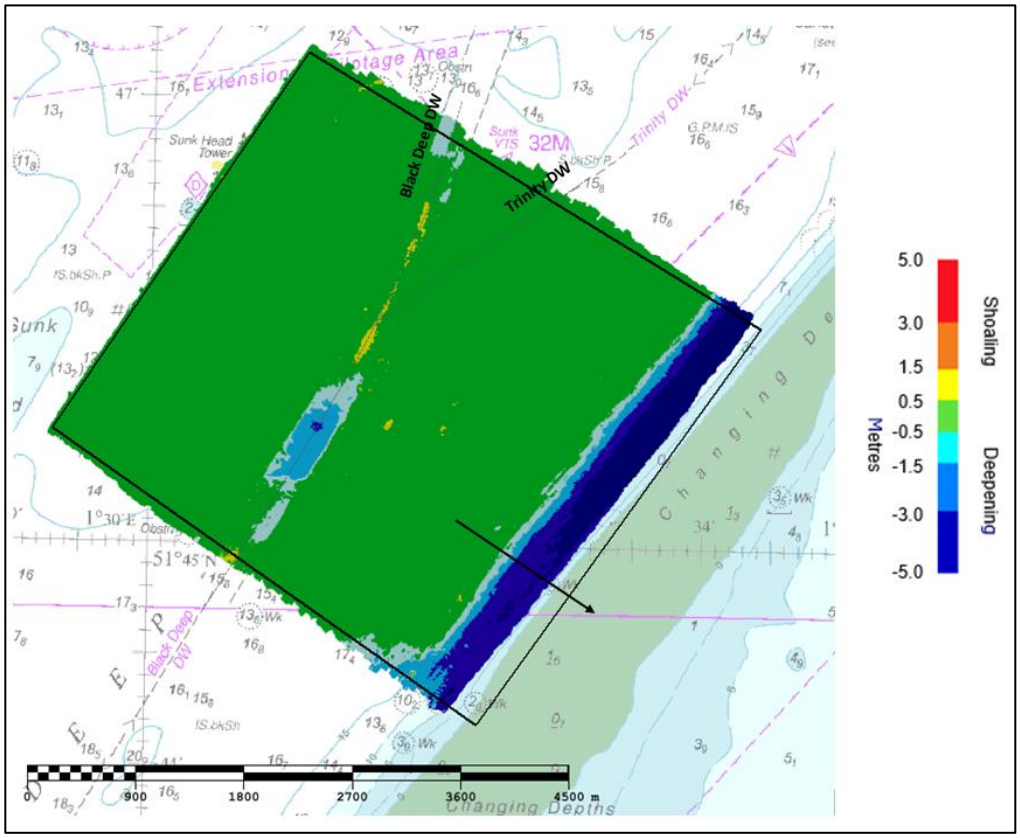

Figure 4: Difference surface showing bathymetric changes between the 2008 and 2020 surveys overlaid on BA Chart 1975-0 (Black arrow represents SE migration of Long Sand since 2008 survey).

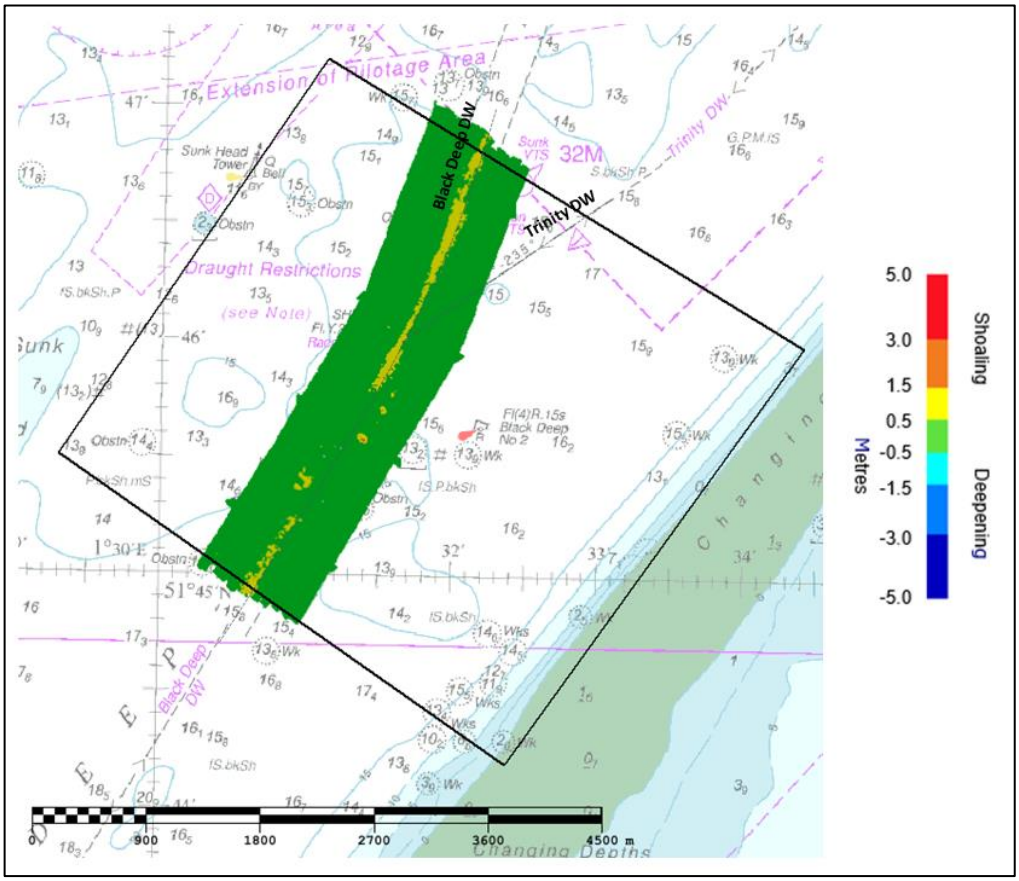

Figure 5: Difference surface showing bathymetric changes between the 2016 focused Black Deep DW survey, and the 2020 survey overlaid on BA Chart 1975-0.

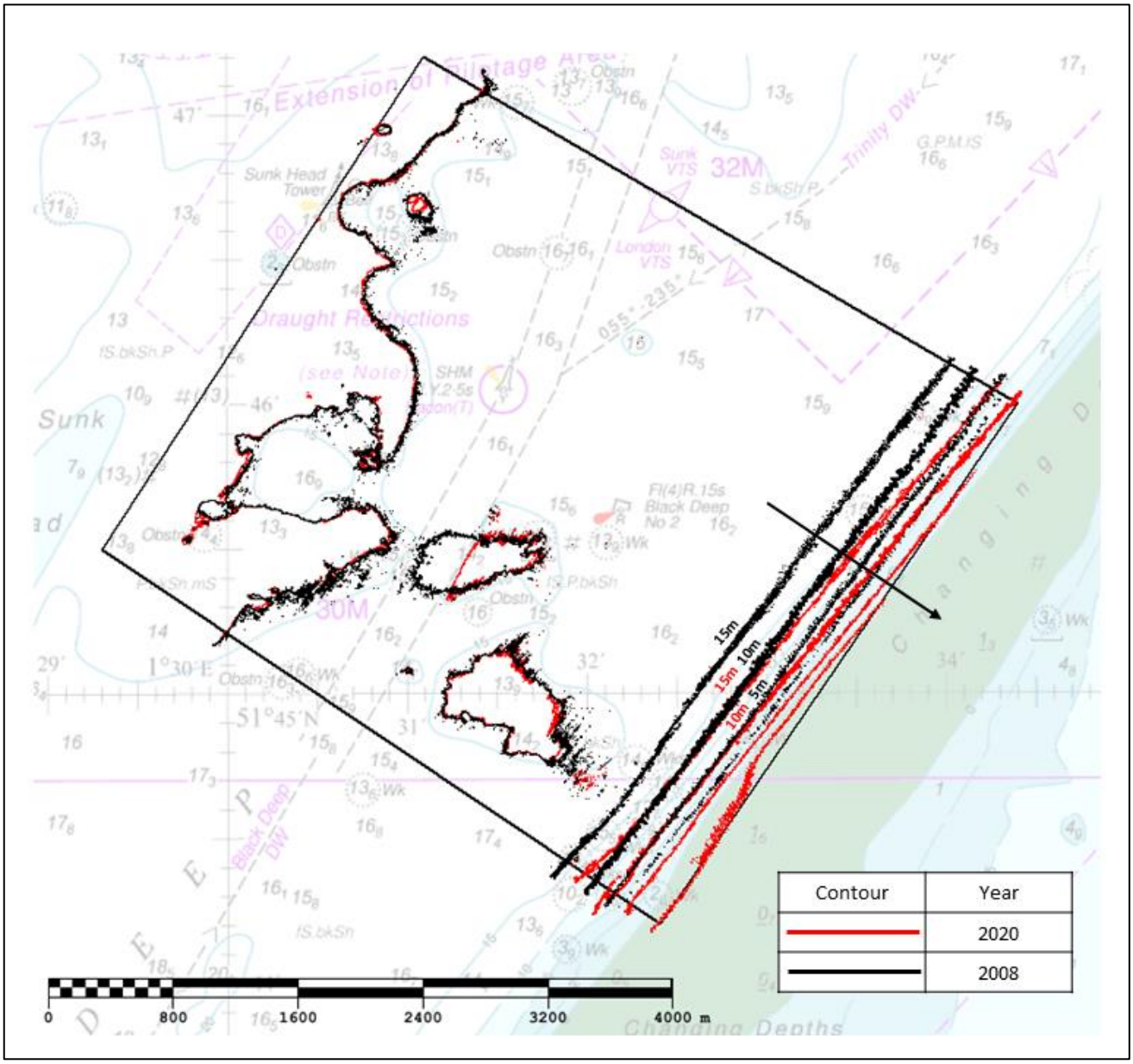

Figure 6: Contour plot showing changes in the 2m, 5m, 10m, 15m contours between 2020 (red) and 2008 (black). Black arrow represents the SE migration of Long Sand.

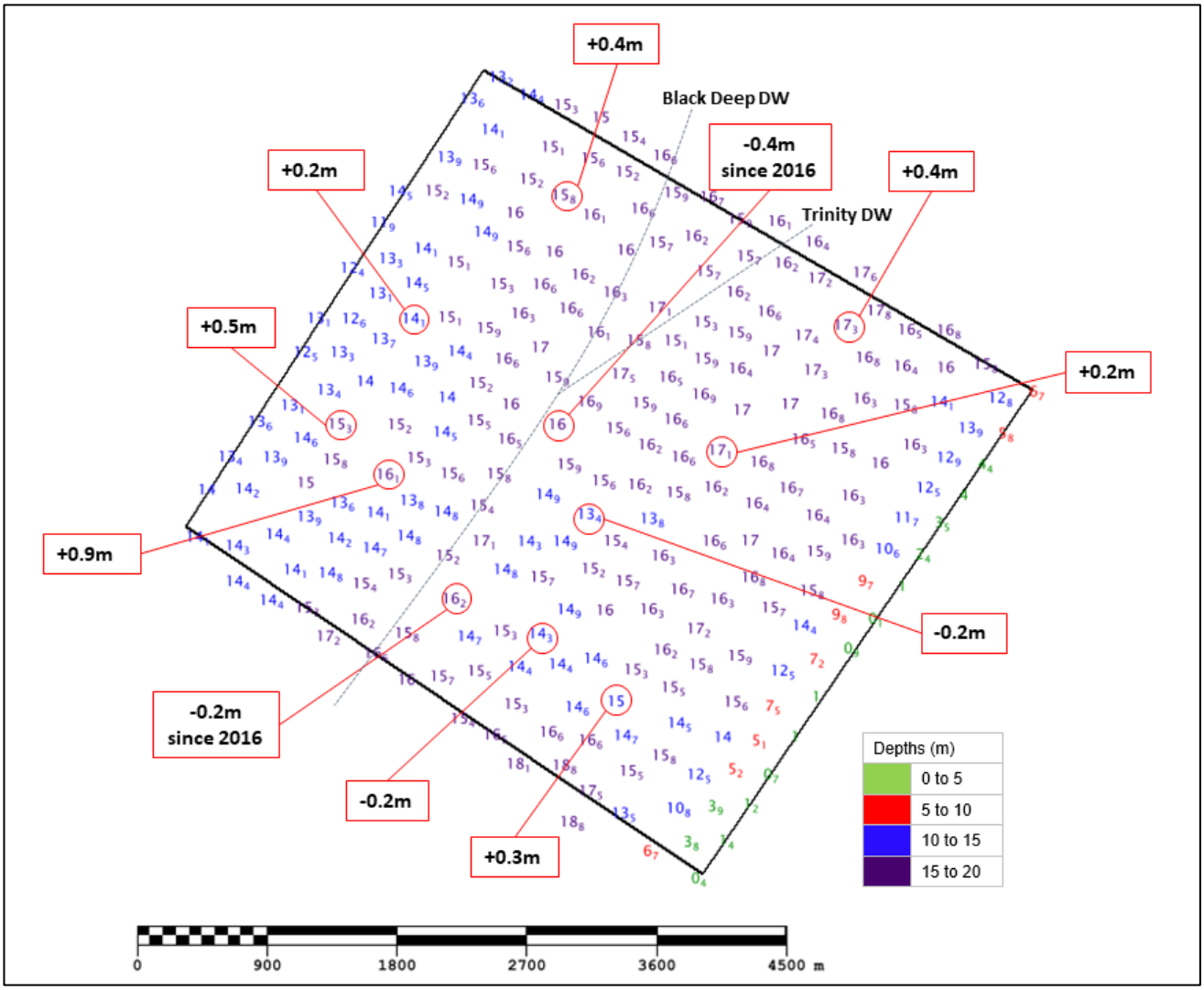

Figure 7: Colour banded depth plot from the 2020 survey with selected depth changes since the 2008 and 2016 surveys. Positive values (+) represent deepening. Negative values (-) represent shoaling.

6. RECOMMENDATIONS FOR FUTURE SURVEYS

Survey Interval

6.1 As there is little change to the large majority of the TE6 area, it is suggested that the full TE6 area should remain on the 12-year survey interval. However, the shoaling (0.4-0.5m) of critical depths in the DWR channel suggests that a 6-yearly focused survey of the DWR be recommended/reinstated (TE6a). A new polygon with coordinates is shown below in Figure 8.

Survey Area

6.2 Current RRS limits are sufficient for this area, covering important controlling depths well. As the migration of Long Sand bank is eastward, and away from the DWR traffic, it does not require extending. The area where a migrating Long Sand may impact traffic is already covered by another RRS area (TE5).

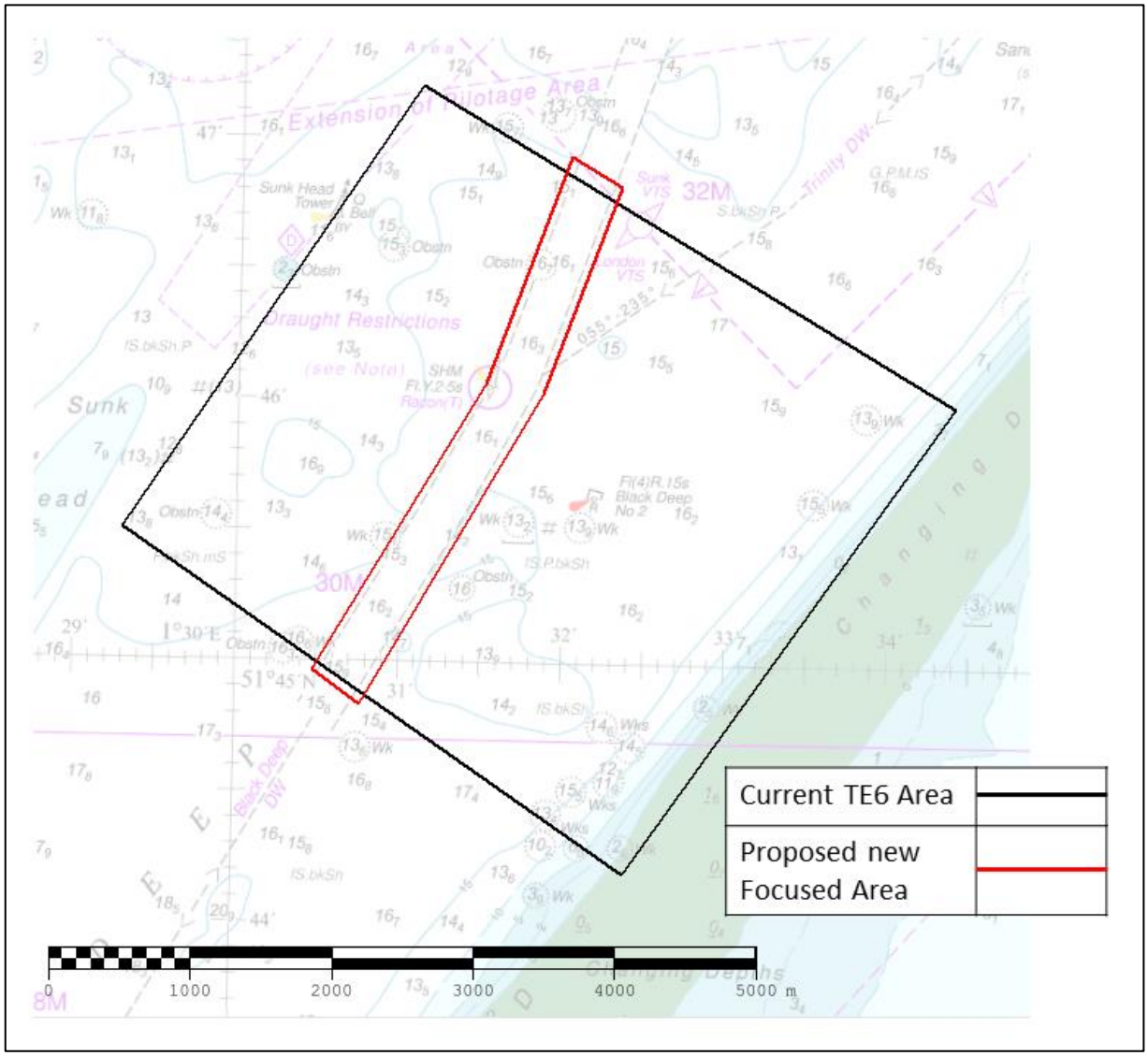

Figure 8: Recommended new survey limits for the DWR channel, within area TE6.

The coordinates of the recommended new/reinstated survey area limits for the 6-yearly focused area of Black Deep DWR are shown below. Area is relatively small (~400m wide, ~4km long).

Black Deep DWR total area: 1.64 km^2

Longitude	Latitude
001-32.021688E	51-46.937982N
001-32.327970E	51-46.824918N
001-31.868694E	51-46.030212N
001-30.767556E	51-44.835726N
001-30.478476E	51-44.965884N
001-31.515918E	51-46.065228N