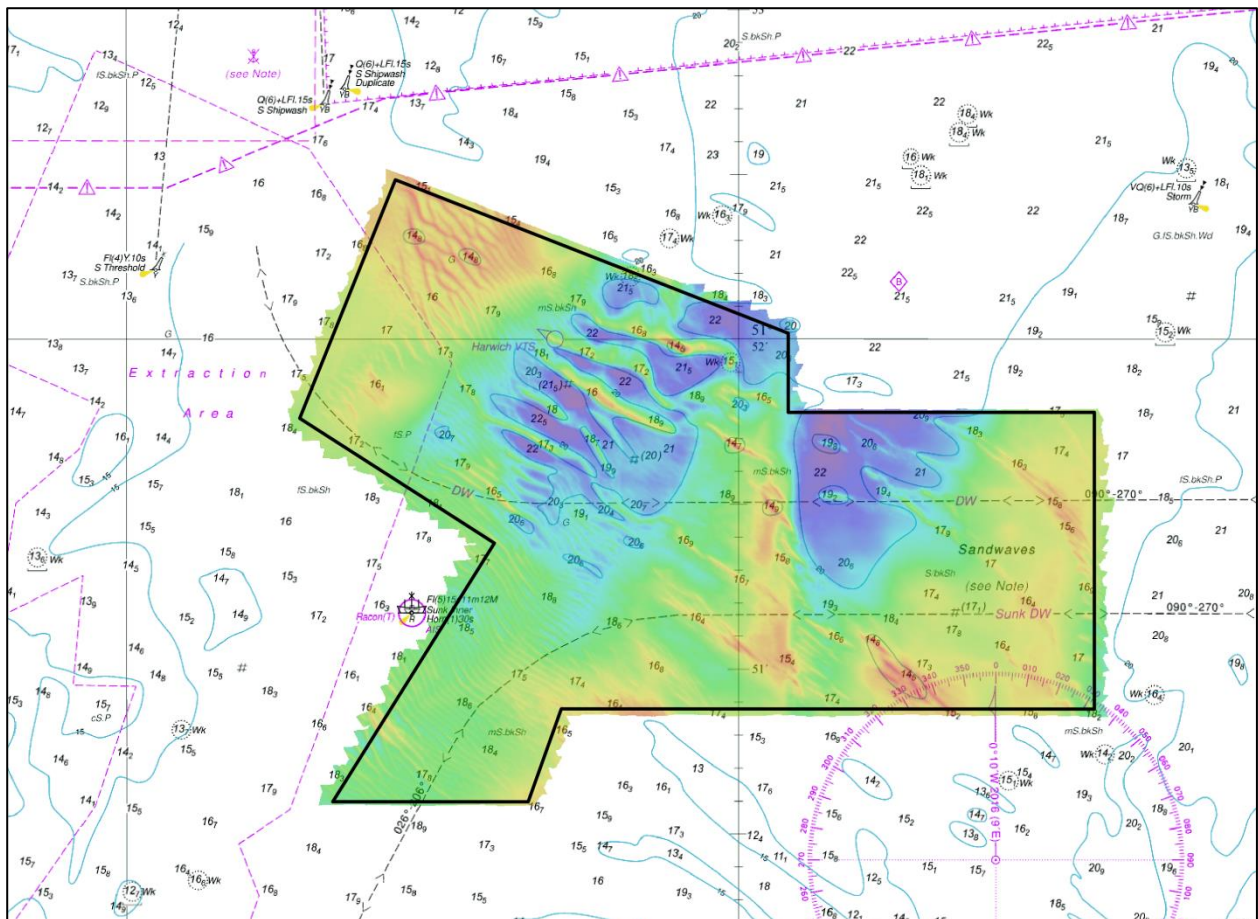




THAMES ESTUARY SUNK

SUMMARY ASSESSMENT ON THE ANALYSIS OF THE FOCUSED ROUTINE RESURVEY AREA TE3A FROM THE 2015 SURVEY



ENGLAND – THAMES ESTUARY SUNK

Summary Assessment TE3A / 2015

A summary assessment of the 2015 hydrographic survey of the area: to monitor recent seabed movement; to identify any implications for shipping; and to make recommendations for future surveys.

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SUNK TE3A, 2015

1 INTRODUCTION

- 1.1 This Assessment is produced by the United Kingdom Hydrographic Office (UKHO) for the Maritime and Coastguard Agency (MCA).
- 1.2 Analysis of the Routine Resurvey Areas forms part of the Civil Hydrography Programme and the reports are made available to members of the Committee On Shipping Hydrography (COSH) through the UKHO website, before being 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 Department for Transport (including the MCA) and the MOD (including the UKHO).
- 1.3 The area covers the approach to the Harwich Deep Water Channel, which is dredged to 14.5 metres. This forms the main approach to Felixstowe, which has berth depths of up to 16 metres. The area also covers part of the Sunk Deep Water track leading into Black Deep.

2 DESCRIPTION OF THE AREAS

- 2.1 The TE3A focused survey area covers 2.66 SQ NM (9.1 SQ km). It includes two recommended deep water tracks. Harwich Deep Water track leads to the entrance of the Harwich Deep Water Channel, which has a maintained depth of 14.5 metres. The Sunk Deep Water track is used by deep draught vessels as an approach to Black Deep and onwards into the Thames Estuary.
- 2.2 In the northwest of the area there is an area of large sandwaves up to 5 metres high. These are strongly asymmetrical with their steeper side facing towards the southwest. To the south of these lies an extensive area of megaripples and symmetrical sandwaves up to 2 metres in height.
- 2.3 The remainder of the area contains bands of megaripples and sandwaves and a gently undulating seabed with depths ranging from around 14.5 to 23 metres.
- 2.4 The area limits are shown at Annex C.

3 SURVEY DATA

- 3.1 The area TE3A was surveyed in both in 2014 as part of HI1459 from the 22nd to 28th June and in 2015 as part of HI1483 between the 15th and 17th of August 2015. In both years the reports of survey mention that the survey was undertaken in generally slight sea states.
- 3.2 Survey data was acquired in both years using a dual head Kongsberg Maritime multibeam echosounder with the model varying from EM2040D in the 2014 survey and EM2040C in 2015 survey. Observations calculated from the height component of the GPS position solution were used to reduce soundings to Chart Datum. Ellipsoidal Height to Chart Datum values were taken from the UKHO Vertical Offshore Reference Framework (VORF), with positions referred to International Terrestrial Reference Framework 2005 (ITRF05). The final dataset from both surveys was in the form of a 1 metre gridded CUBE surface.
- 3.3 The surveys were validated by UKHO and was in accordance with IHO S44 (5th Edition) standard of Order 1a. The 2015 survey data overlaid on BA Chart 2692 is at Annex B.

4 CHANGES SINCE THE 2014 SURVEY

- 4.1 The survey data in Annex B, variability plot in Annex C and Cross section comparisons of the 2012 and 2014 surveys in Annex D show that sandwaves in the area are up to 5 metres high. Comparison plots of the 15 and 20 metre contours in Annexes G and H show that sandwaves are generally migrating in a south-southwest direction in the western half of the area generally by 20 to 25 metres. In the eastern half of the area, sandwave migration is of a reduced magnitude (10 to 20 metres) and is more southward.
- 4.2 Colour banded depth plots of the 2012 and 2014 surveys are at Annexes E and F respectively highlight local shoals and controlling depths, with Annex F giving the change in depth since the previous survey. The annexes are summarised below
- a) Depths along the deep water tracks have generally not changed significantly. However, the controlling depth on Harwich Deep Water track has shoaled by 0.4 metres from 15.3 to 14.9 metres.
 - b) Minimum depths over sandwaves are broadly similar to those found in the 2014 survey, but with ongoing migration of sandwaves.
 - c) The minimum depth in the area is 14.5 metres, 340 metres south of Sunk Deep Water track.

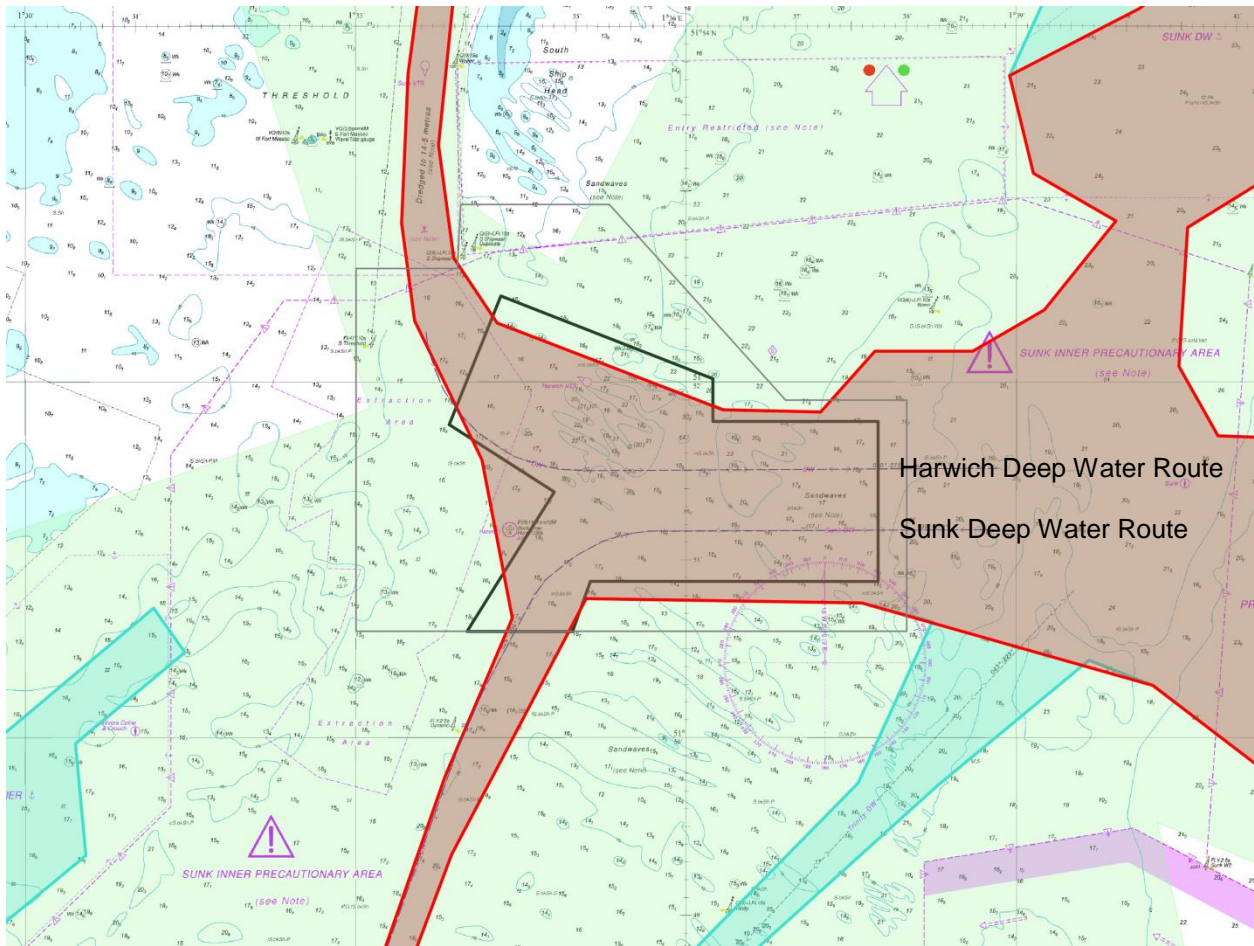
5 IMPLICATIONS FOR SHIPPING

- 5.1 The Harwich Deep Water Channel is dredged to 14.5 metres and depths of less than this in the approach to the channel would be of potential concern to shipping. The controlling depth is still deeper than the maintained depth, but has shoaled since the previous survey to 14.9 metres, so may be of concern in the future and impact the maintenance of the route.
- 5.2 The annual focused limits adequately cover shoal areas transited by deep draught container vessels.

6 RECOMMENDATIONS

- 6.1 Based on this single year analysis the full survey limits and 2 year frequency are still appropriate and should be retained.
- 6.2 Due to the apparent stability of the majority of the survey area a longer term study should be conducted to confirm the sandwave movement is in a continuous direction and may encroach on the charted DWR.

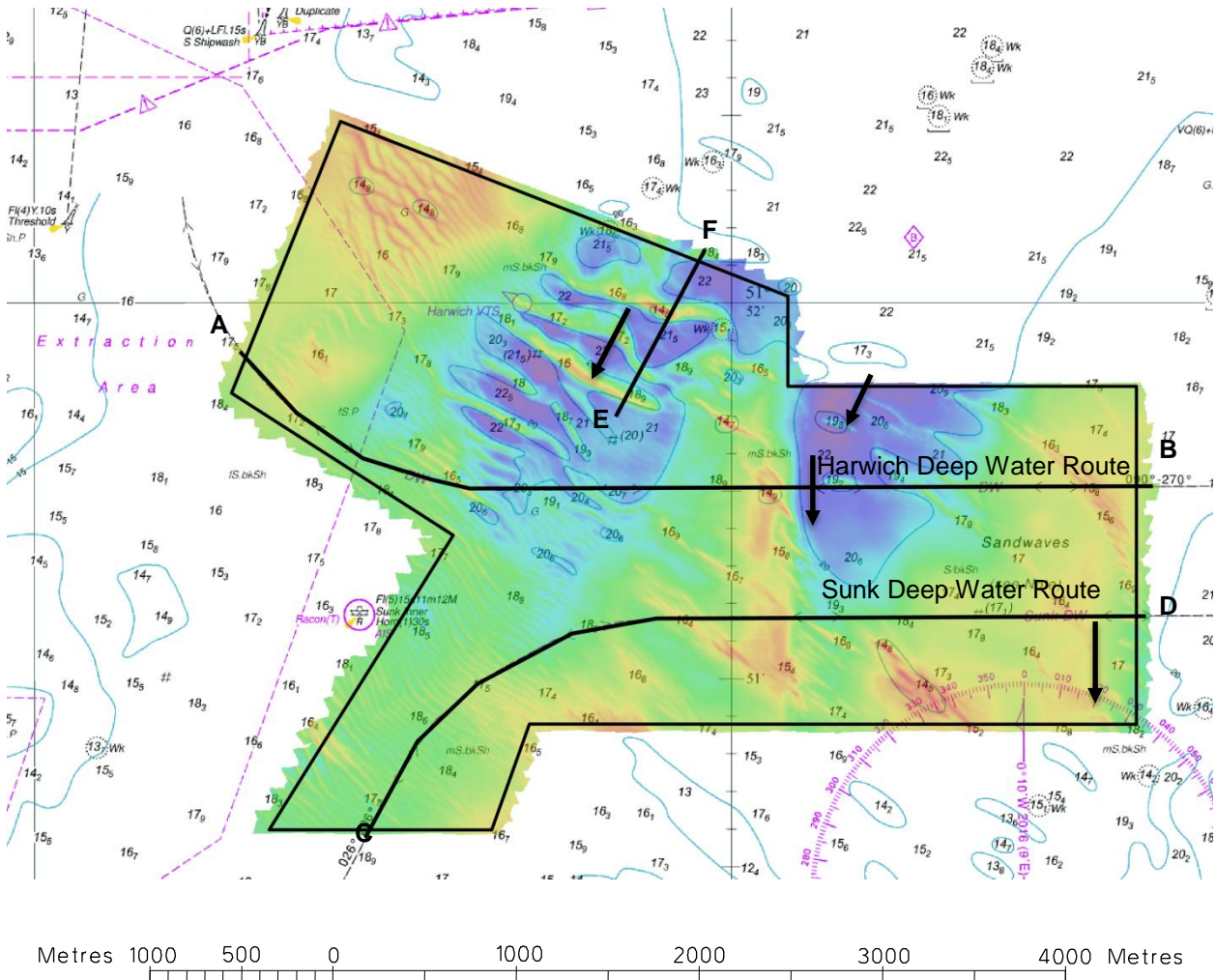
SHIPPING ROUTES



Note: Data from satellite AIS data for FY2015/2016 of vessels larger then 2000GT

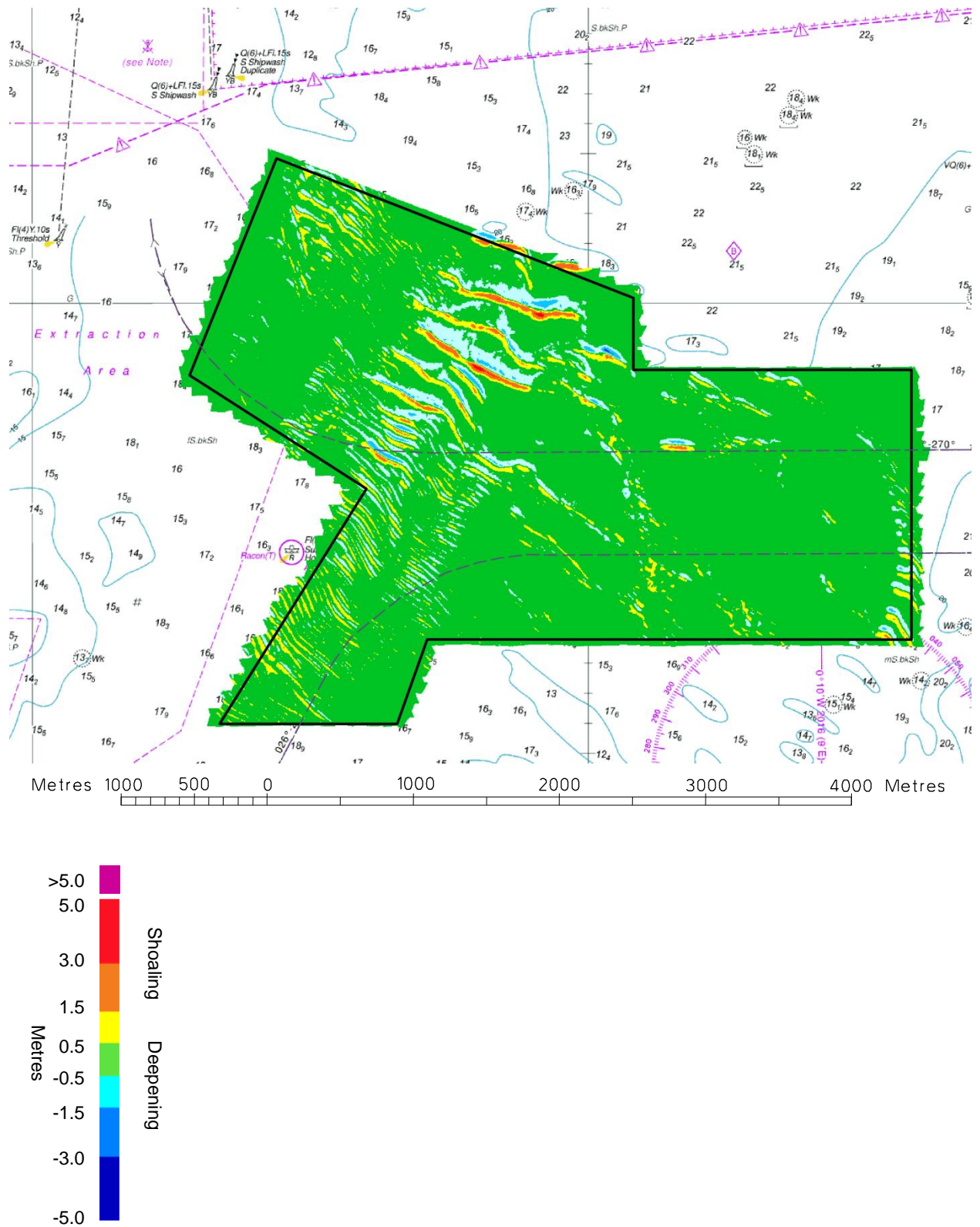
- Vessel draft <10 metres
- Vessel draft >=10 metres
- Deep Water Route
- TE3A limits (2015 focused survey)
- TE3A limits (2014 full survey)

2015 SURVEY DATA OVERLAID ON CHART 2692
 WITH LOCATIONS OF CROSS SECTION COMPARISONS
 (Shown at Annex D)



- Direction of sandwave migration
- Profile

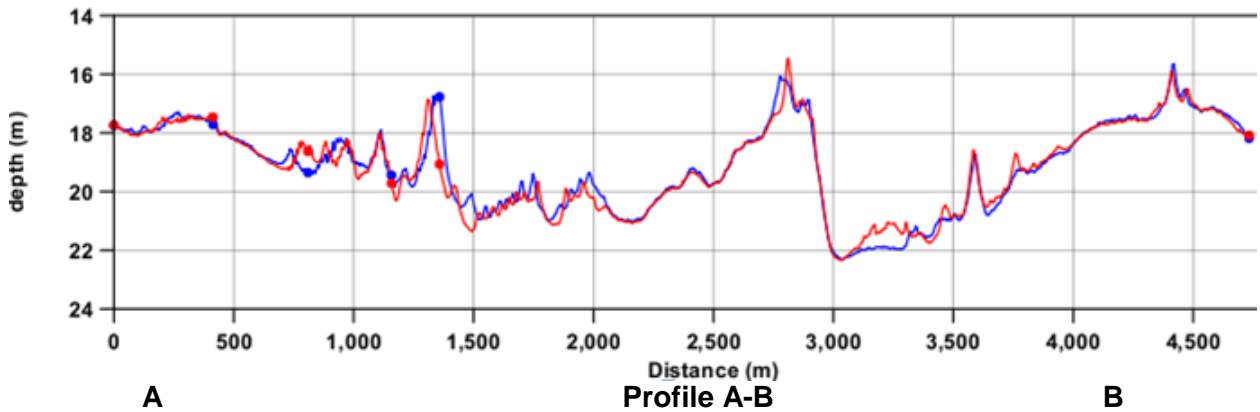
VARIABILITY PLOT SHOWING BATHYMETRIC CHANGES BETWEEN THE 2014 AND 2015 SURVEYS



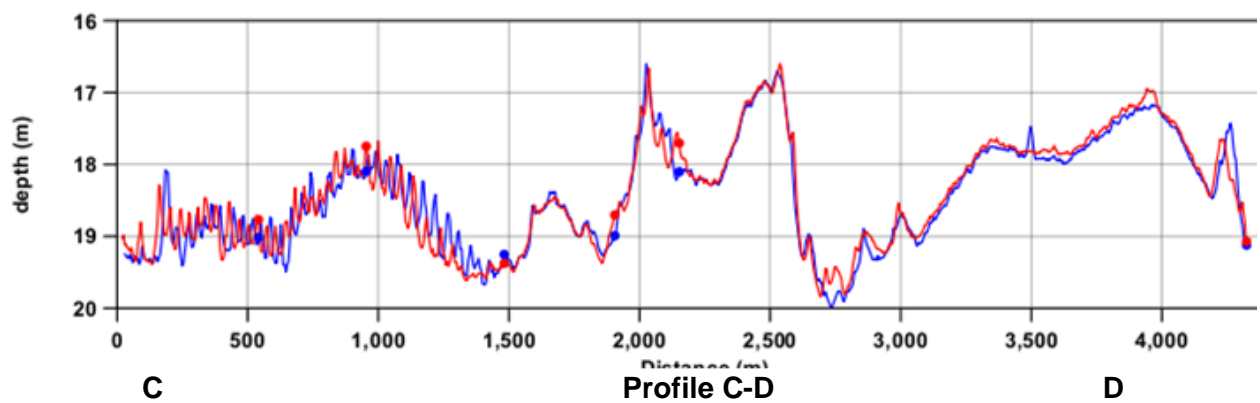
PROFILE COMPARISONS FROM THE 2014 AND 2015 SURVEYS

(See Annex B for Locations)

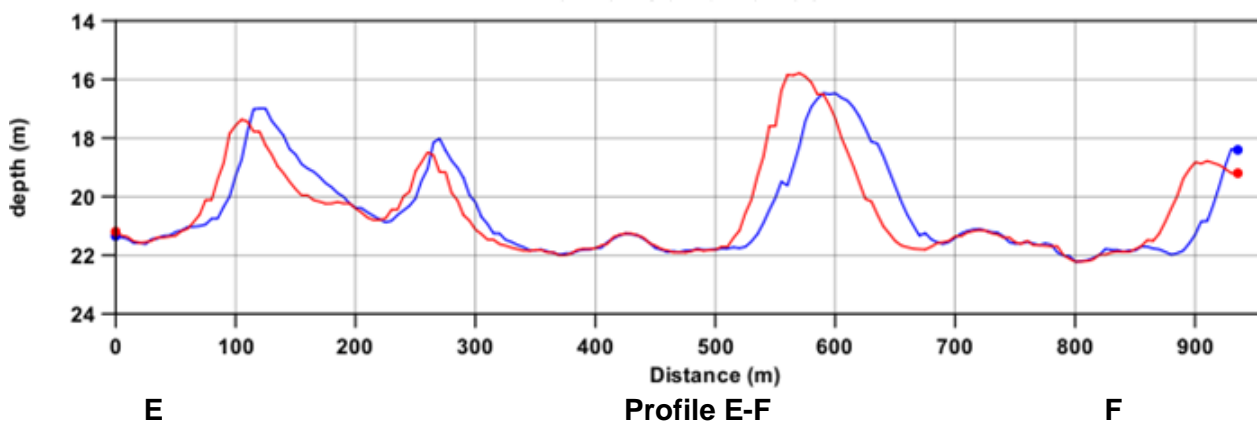
Harwich Deep Water Route



Sunk Deep Water Route

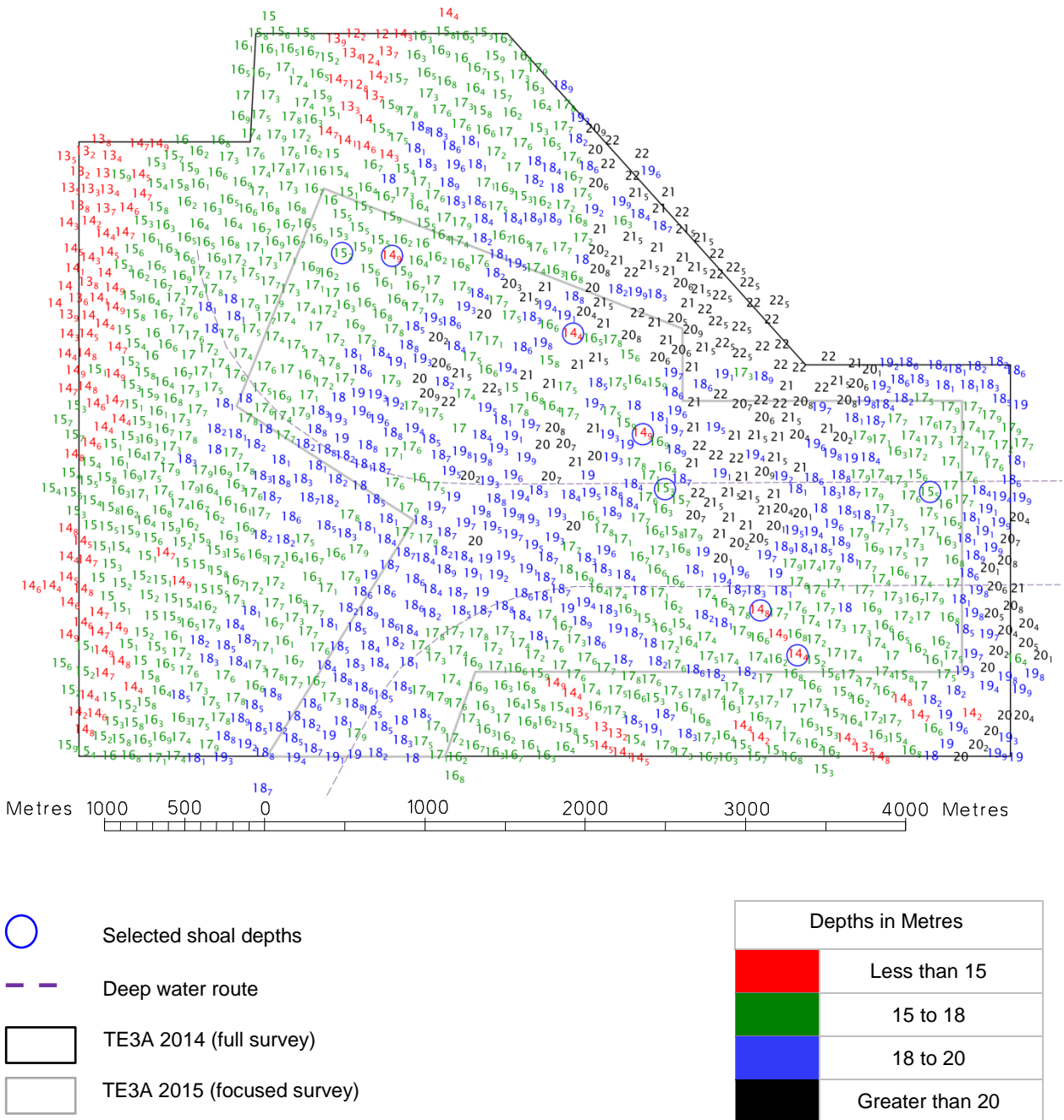


In area of greatest sandwave migration

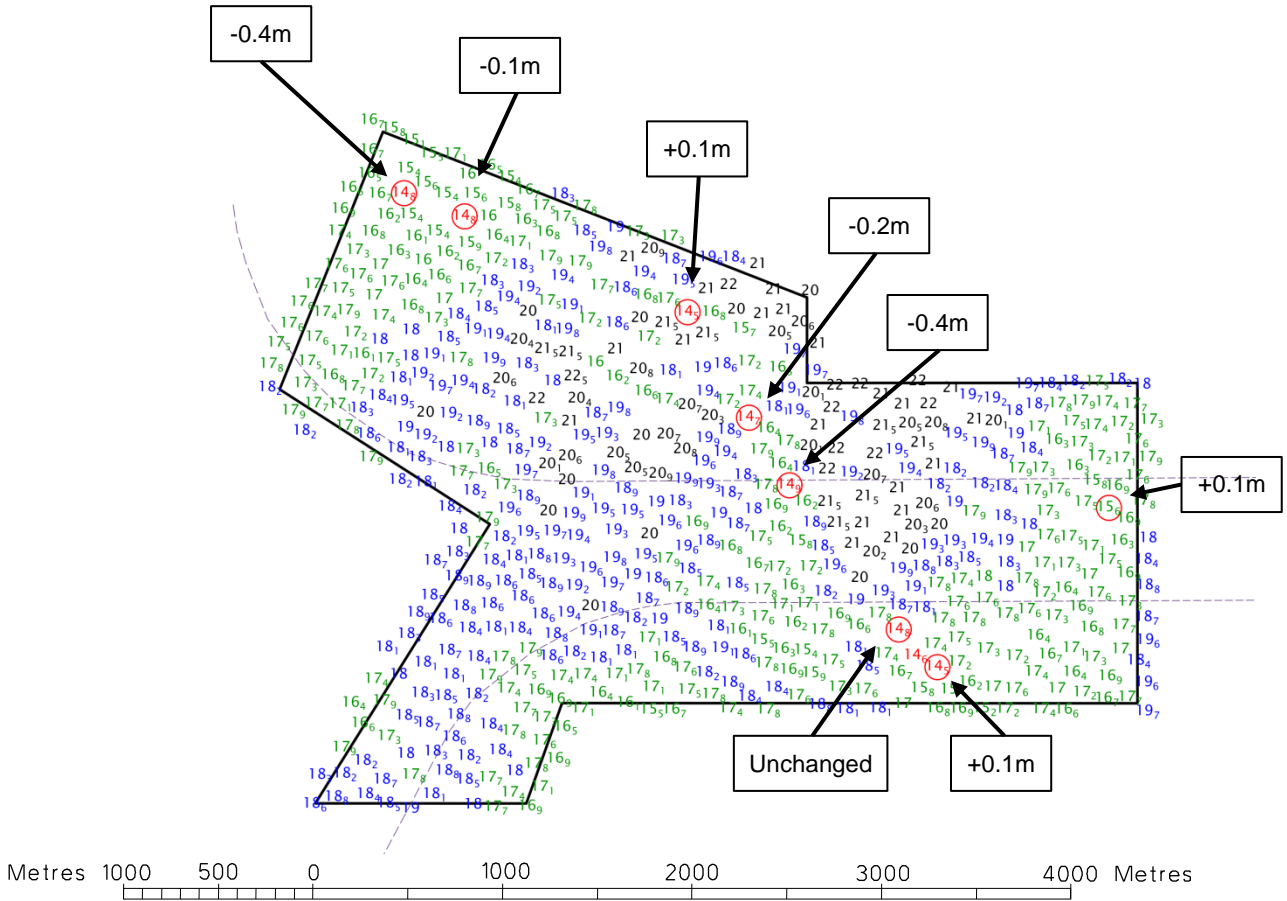


Year of Survey	
—	2015
—	2014

COLOUR BANDED DEPTH PLOT
FROM THE 2014 SURVEY
SHOWING SELECTED DEPTHS



COLOUR BANDED DEPTH PLOT
FROM THE 2015 SURVEY
SHOWING SELECTED DEPTHS



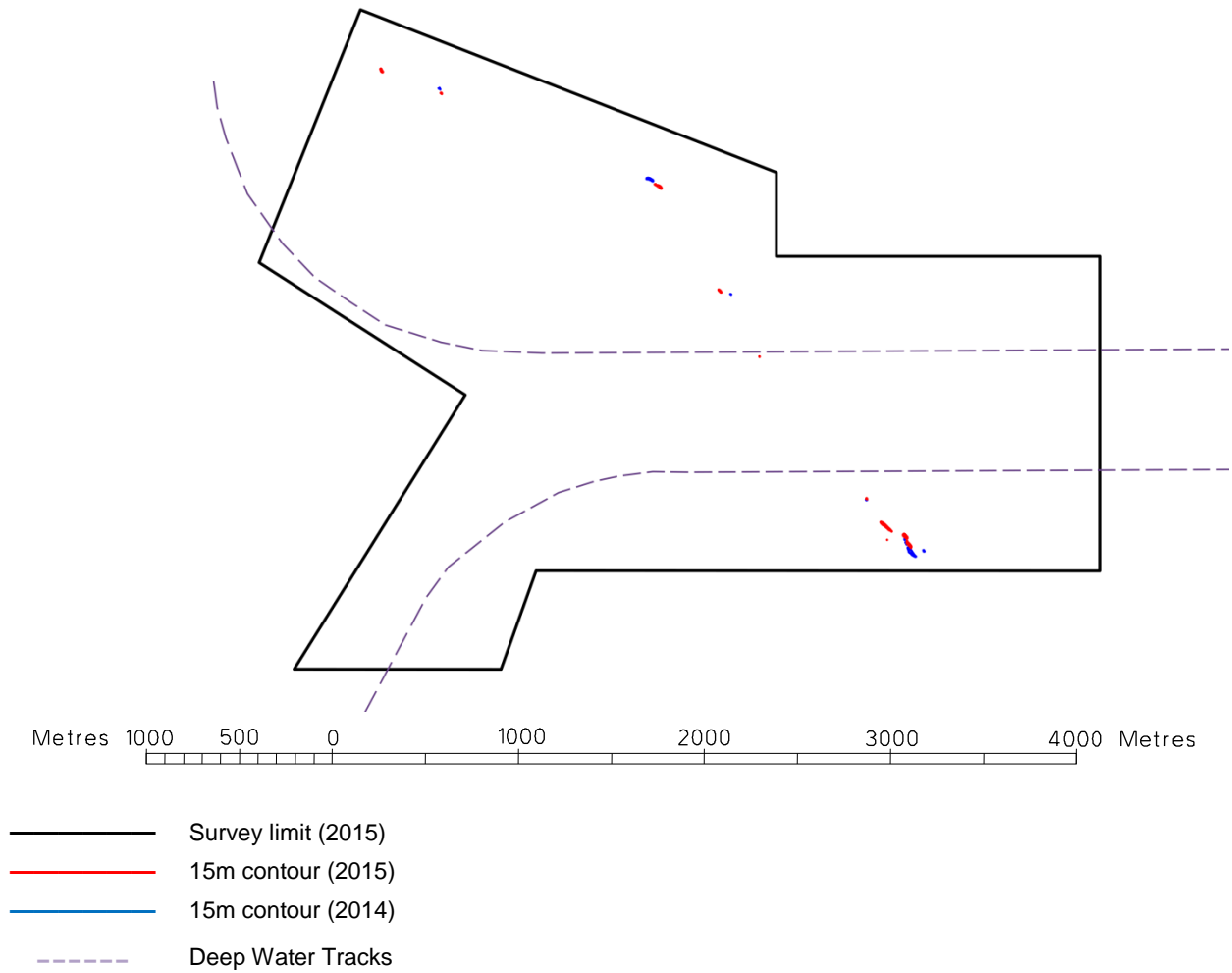
Depth changes indicated above are from the closest corresponding 2014 sounding available. Hence depth differences will be from different positions from the 2015 sounding selection as an automatic shoal bias sounding selection tool has been utilised which produces a representation of the shoal values in a data set.

Deepening + Positive value / Shoaling - negative value.

- Selected shoal depths
- Deep water route
- TE3A 2015 survey boundary

Depths in Metres	
	Less than 15
	15 to 18
	18 to 20
	Greater than 20

COMPOSITE DIAGRAM OF THE 15 METRE CONTOUR
FROM THE 2014 AND 2015 SURVEYS
SCALE 1:40,000



COMPOSITE DIAGRAM OF THE 20 METRE CONTOUR
FROM THE 2014 AND 2015 SURVEYS
SCALE 1:40,000

