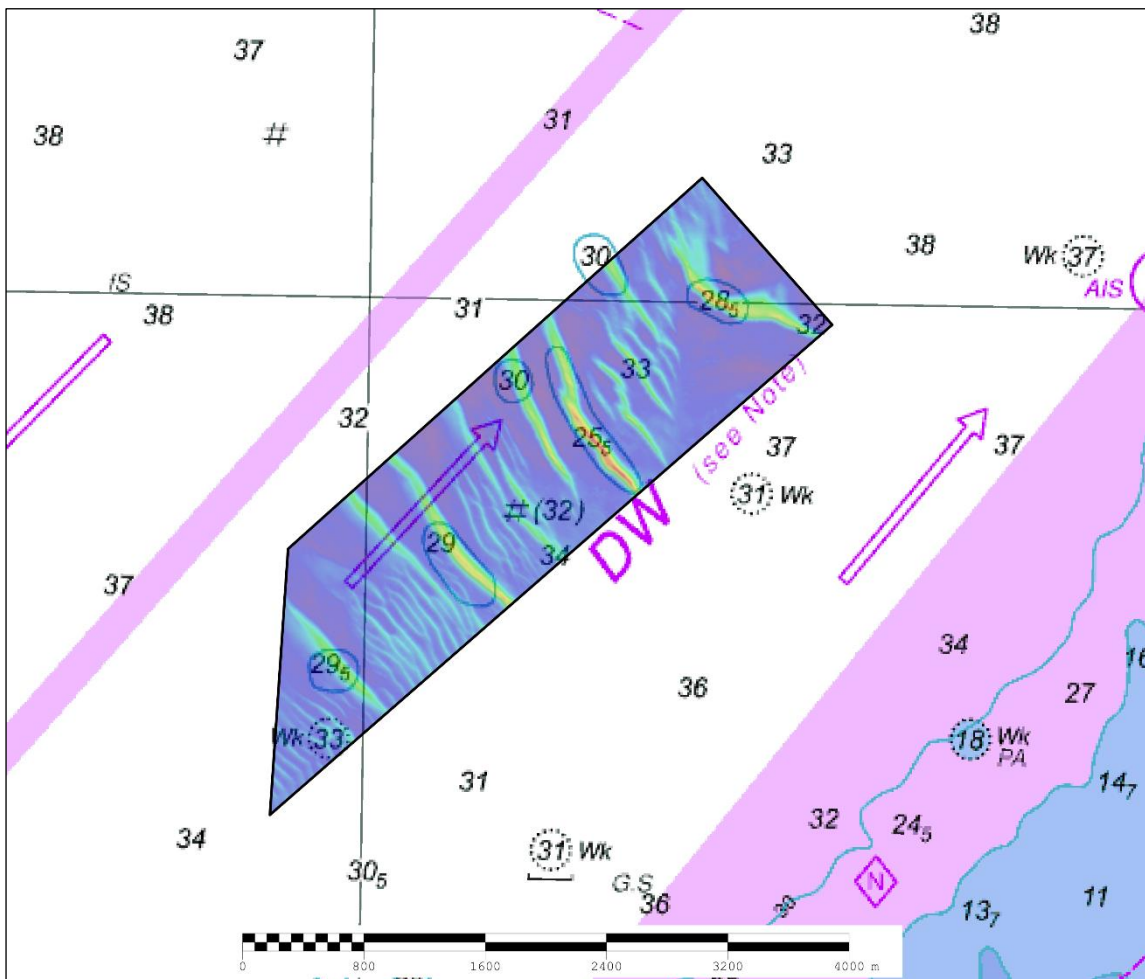




DOVER STRAIT DEEP WATER ROUTE T - FOCUSED ASSESSMENT DWR T/2016 V2

An assessment of the 2016 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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DOVER STRAIT, DWR-T FOCUSED, 2016

1. EXECUTIVE SUMMARY

The Area and Recent Changes

- 1.1 DWR T focused area lies within the Sandettié Deep Water Route, which forms part of the north-east bound lane of the Dover Strait Traffic Separation Scheme (TSS). Sandettié Bank lies to the southeast and South Falls to the west. The area is currently surveyed every 3 years as part of the Routine Resurvey Programme. The largest draught vessel observed passing the area in 2016 was 23.1m.
- 1.2 A sandwave field lies across the area. These sandwaves are widely spaced and generally orientated 145°/325°, ranging in height from 2 to 10m. The controlling depth measured in the 2016 survey, located just north-east of the area's centre, is 25.8m; compared to 28.5m in 2013.

Reasons for Continuing to Resurvey the Area

- 1.3 The controlling depth in the area as decreased significantly since the 2013 survey, and poses a risk to deep draught vessels passing through the area.

Recommendations

- 1.4 Following the significant decrease in depth along the largest sand wave in the area; it is recommended that the DWR T focused area resurvey interval should be reduced to every 2 years and hence should be resurveyed in 2018.
- 1.5 The south-eastern limit of the focused area should be extended eastward to monitor sandwaves along the Deep-Water Track which currently extend beyond the focused area limits.

2. INTRODUCTION

- 2.1 This Assessment is produced by the United Kingdom Hydrographic Office (UKHO) for the Maritime and Coastguard Agency (MCA).
- 2.2 Analysis of the Routine Resurvey Areas forms part of the Civil Hydrography Programme and the reports are made available to all interested parties through the UKHO website and are presented to the Civil Hydrography Working Group. When approved, the recommendations are incorporated into the Routine Resurvey Programme.
- 2.3 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.
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3. AREA HISTORY

3.1 Summary of Surveys:

Year	Survey	Reference	Data	Year	Survey	Reference	Data
1970	K6006			1994	M2296	HH090/635/01	s.d
1971	K6274			1995	M2470 ²	HH090/651/01	s.d
1981	K8495 ¹	H2820/71		1996	M2673	HH090/692/01	s.d
1984	K9390	H2898/83	s.t	1997	M2830	HH090/746/01	s.d
1985	K9713	H2346/84	s	2000	M3415	HH090/891/01	s.d
1986	K9867	H2348/85	s	2003	M3927	HH090/1025/01	s.t.d
1989	M1344	HH090/460/01	s.t.d	2006	HI1159	SDRA 20072068	m
1990	M1609	HH090/492/01	s.d	2009	HI1294	SDRA 200929529	m
1991	M1780	HH090/519/01	s	2013	HI1434	SDRA 2013269142	m
1992	M1914	HH090/555/01	s.t.d	2016	HI1523	SDRA 2016-181431	m*
1993	M2151	HH090/578/01	s.d				

Key: s = sonar sweep, t = seabed texture tracing, d = digital data, m = multibeam digital data, * = focused survey
Single-beam surveys (prior to 2004) conducted at 1:25,000 scale

3.2 Summary of historical recommendation enacted

Year	Remarks
1984	Area DWR T established (H6026/82-E53)
1993	Report recommended the limits of this area to be increased to cover the full width of the recommended track and moved 875m NE to encompass the sandwave field in area S. They were further increased SW to cover sandwaves in area U when it was removed from the resurvey programme in 1993 (HA145/02/3/03-E9).
1995	Area T partially surveyed by Dutch M2470/3&4.
1998	Area changed from one to three years (HA 145/002/003/07)
2003	3-year focused survey of sandwave crests and full 12-year survey recommended, but full 3-year survey continued to avoid running lines at right-angles to shipping.
2013	Focused area with 3-year survey interval recommended, covering areas where depths are less than 30m (since 2000). Interval for remainder of the area to be extended from 3 years to 6 years. First focused area scheduled for 2016.

4. DESCRIPTION OF THE AREA

- 4.1 DWR T Focused area resulted from the recommendations made in the 2013 assessment to provide additional information where depths are under 30m. The area lies within the Sandettié Deep Water Route which forms part of the north-east bound lane of the Dover Strait Traffic Separation Scheme (TSS). Sandettié Bank lies to the southeast and South Falls to the west.
- 4.2 The sandwaves present in the area are widely spaced and generally orientated 145°/325°, ranging in height from 2 to 10m. The shallowest depth measured in the 2016 survey is 25.8m and is located just north east of the area's centre.
- 4.3 Area Covered: 1.57 NM² (5.40 km²) as shown in Figure 1 below.

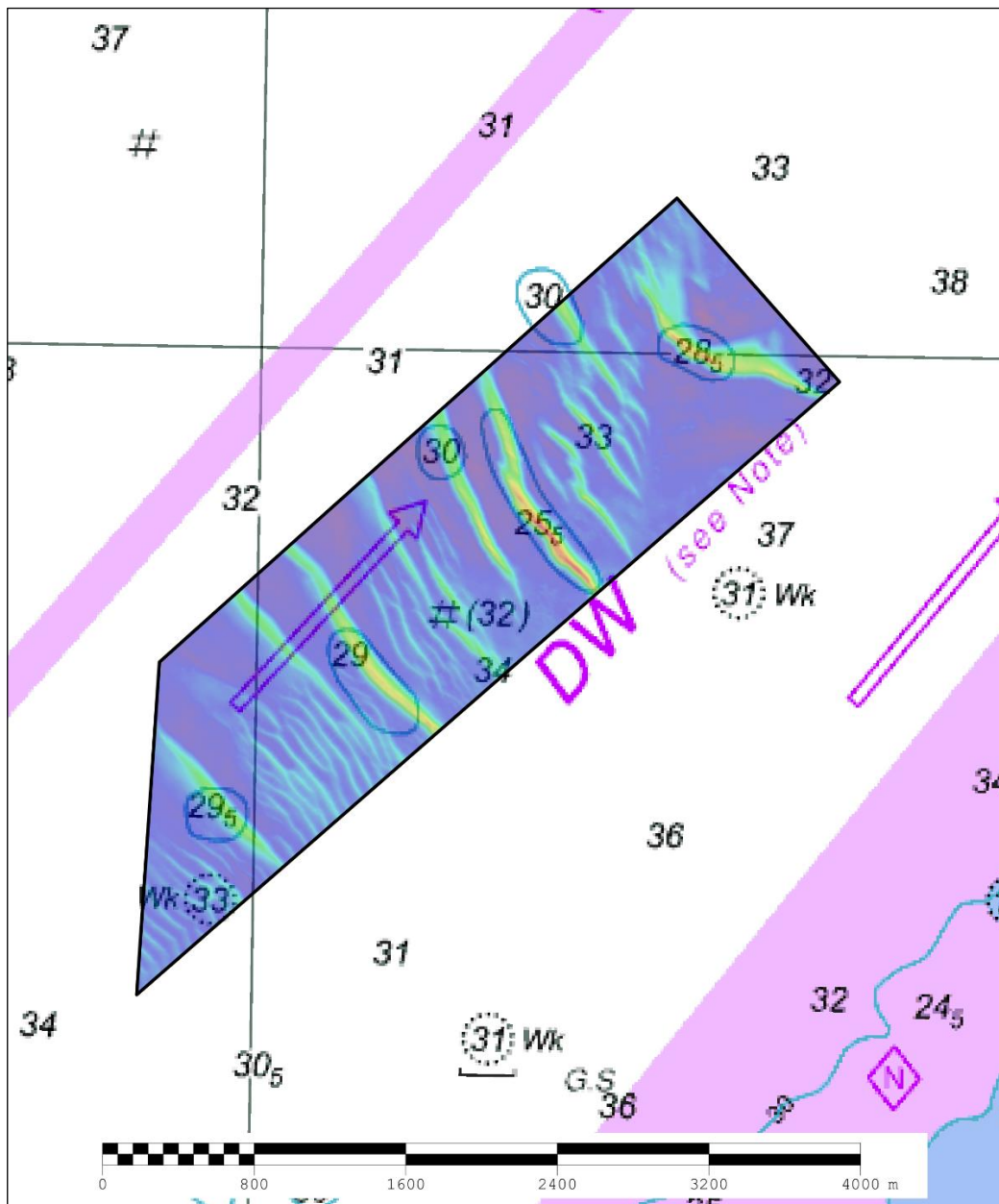


Figure 1 – 2016 survey data sun-illuminated view overlaid on BA Chart 323

- 4.4 The geographic limits at the time of resurvey are shown in the Table 1 below and coordinates are in Decimal Degrees referenced to WGS84:

Point	Latitude (N)	Longitude (E)
A	51.23490	1.82592
B	51.25730	1.86450
C	51.24870	1.87700
D	51.21910	1.82460

Table 1: HI1523 DWT T Focused Area Survey Limits

- 4.5 Survey interval at time of resurvey: Focused Area 3 yrs, Full Area 6 yrs

- 4.6 Largest scale chart: BA323 (Scale 1:75,000)

5. SHIPPING IN THE AREA

- 5.1 Shipping data from satellite AIS data for 2016 of vessels larger than 2000GT shows the maximum draught vessel to transit through the area was 23.1m.
- 5.2 The UKHO publication NP28 Dover Strait Pilot 11th edition Paragraph 2.74 to 2.77 details the UK's recommended under keel allowances for deep draught vessels within the Dover Strait. Within DWR T focused area the recommended Under Keel Allowance to be applied to stationary draught is 6.4m. Please note that additional guidance is provided in the Netherlands Deep Draught Planning Guide (HP 8) and both documents should be consulted to establish the factors and assumption made in reaching this under keel allowances.

6. REFERENCE SURVEY DETAIL

- 6.1 The last historical Routine Resurvey Programme survey to be undertaken was in 2013 under HI1434 and has been used as the reference to compile this assessment. Survey operations were conducted between the 29th November and the 10th December 2013 in conjunction with other areas. Weather standby was reported on the 30th November and between the 5th and the 8th December. Sea states during the survey were reported as Smooth to Moderate (2 to 4).
- 6.2 The survey data was acquired using multibeam echo-sounder system. The primary reference position system used GNSS and was supplemented by a dynamic GNSS Precise Point measuring system. The survey is referred to the European Terrestrial Reference Frame 1989 (ETRF89) datum.
- 6.3 Observations from GNSS 3D positioning were combined with the UKHO Vertical Offshore Reference Frame (VORF) to reduce depths to Chart Datum. The final deliverable was a 1m resolution CUBE (Combined Uncertainty and Bathymetry Estimator).
- 6.4 The survey was validated by UKHO and met IHO S44 (5th Edition) Order 1a standards.
- 6.5 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from INSPIRE portal and MEDIN Bathymetry Data Archive Centre.

7. COMPARISON SURVEY DETAIL

- 7.1 The latest survey undertaken as part of the CHP Routine Resurvey was in 2016 under HI1523. Survey operations were conducted on the 29th and 30th July 2016. A short period of weather standby was reported on the 29th July. Sea state during the survey ranged from Smooth to Moderate (2 to 4).

- 7.2 The survey data was acquired using multibeam echo-sounder system. The primary reference position system used GNSS and was supplemented by a dynamic GNSS Precise Point measuring system. The survey is referred to the European Terrestrial Reference System 1989 (ETRS89) datum.
- 7.3 Observations from GNSS 3D positioning were combined with the UKHO Vertical Offshore Reference Frame (VORF) to reduce depths to Chart Datum. The final deliverable was a 1m resolution CUBE (Combined Uncertainty and Bathymetry Estimator).
- 7.4 The survey was validated by UKHO and met IHO S44 (5th Edition) Order 1a standards.
- 7.5 The Report of Survey for this survey is available upon request from the UKHO and the validated bathymetric surfaces are available to download from INSPIRE portal and MEDIN Bathymetry Data Archive Centre.

8. DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 8.1 The 35m Contour Plot shown in Figure 3 illustrates sandwaves advancing up to 80m north east in the southern half of the area. With the magnitude of this movement decreasing further to the north east leading to a reversal at the eastern most extent of the area south-southwest (refer paragraph 8.3 for additional details). This contrasts with the general southward migration observed along the eastern edge of the area in the 2013 report.

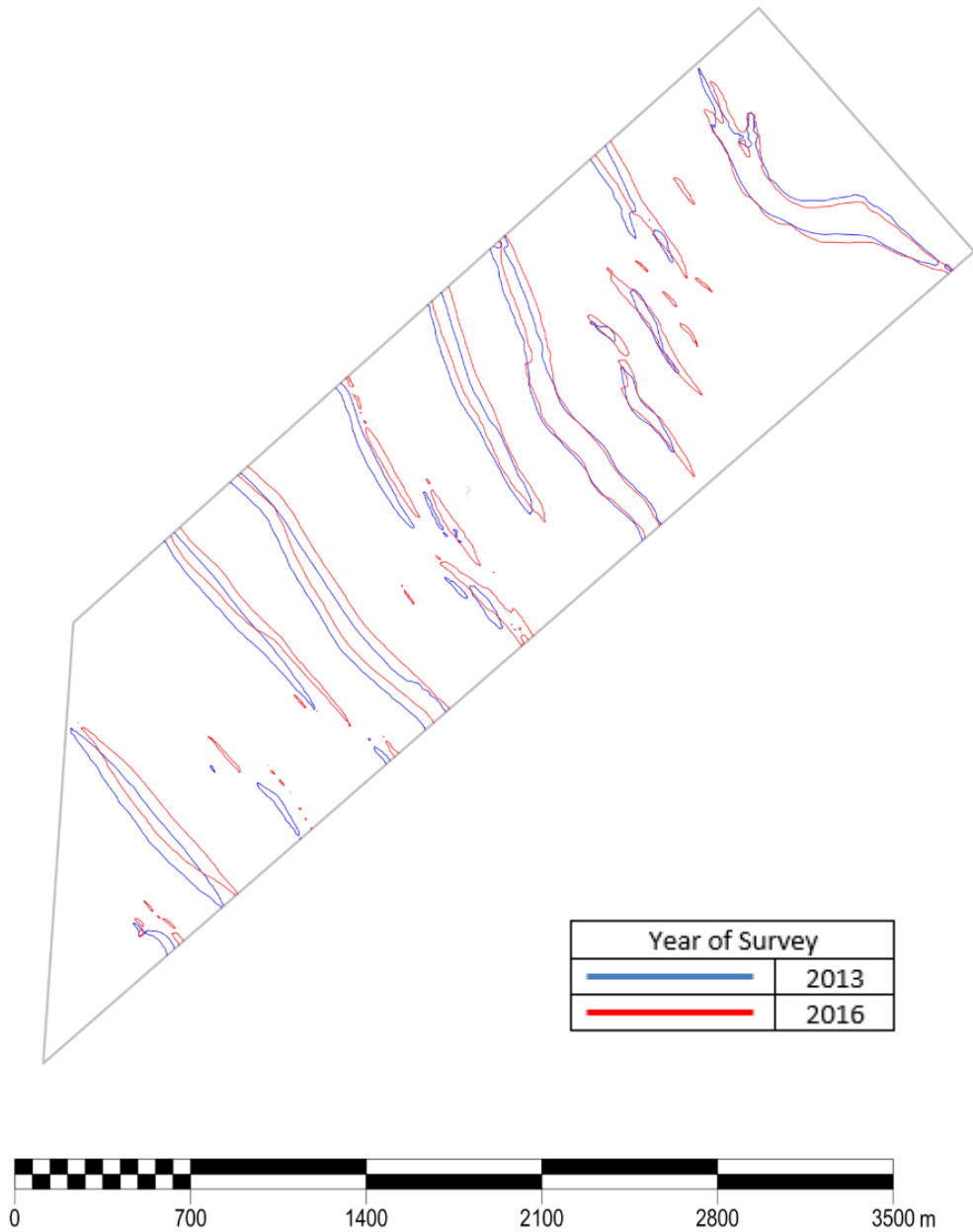


Figure 2 – 35m contour from the surveys carried out in 2013 and 2016

8.2 The Variability Plot in Figure 3 and Profile Comparison A-B in Figure 4 support the statements made above and also highlights the significant decreases in depths to the north east of the area since 2013 as the more stationary sandwaves have built up. The 2013 report highlighted a southward migration of this sandwave by approximately 30m, compared with little to no movement observed in the 2016 survey. The controlling depth within the survey limits in 2016 was measured as 25.8m compared with 28.6m in same location for 2013 as is shown in Figure 6.

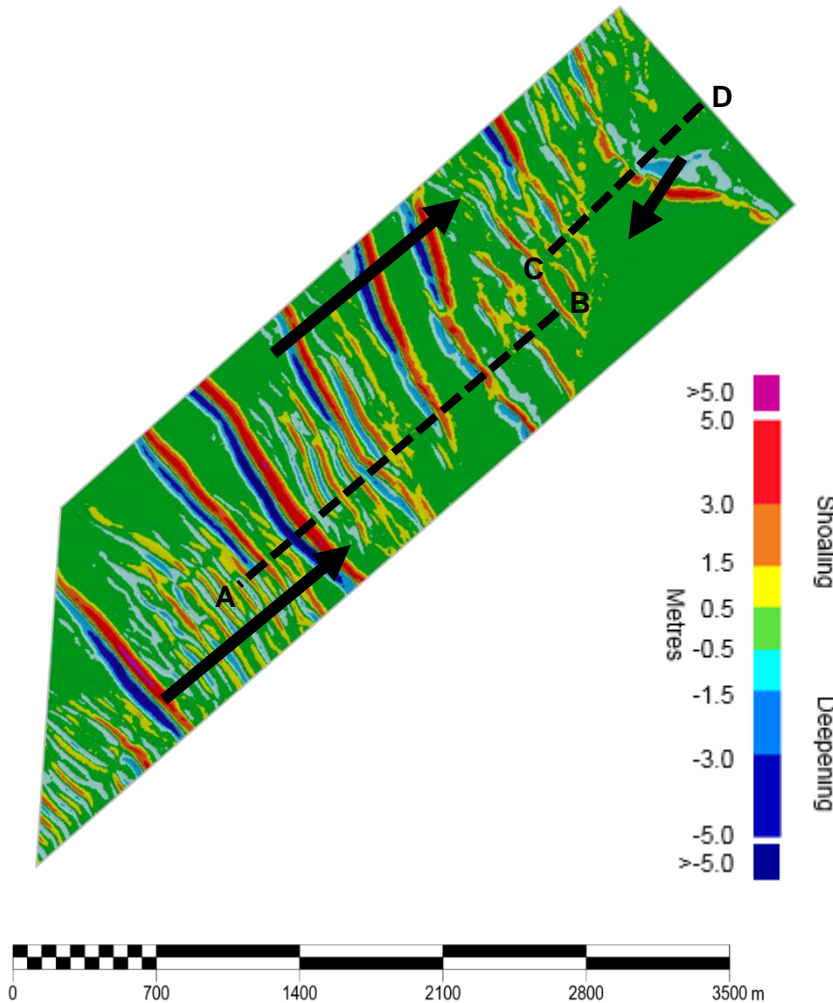


Figure 3 – Variability plot showing Bathymetric Changes between the 2013 and 2016 Surveys. Arrows indicate the general direction of sediment movement.

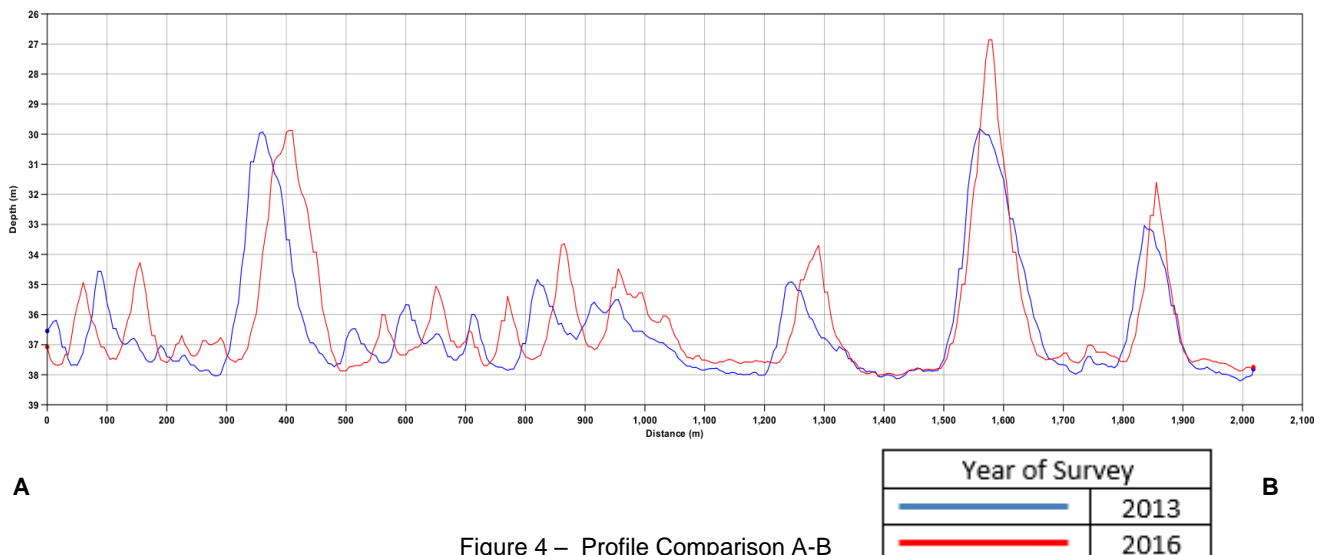


Figure 4 – Profile Comparison A-B

8.3 Profile Comparison C-D in Figure 5 below is in the north east of the survey area and covers the sandwave that contained the controlling depth in 2013. The profile shows the sandwave has migrated approximately 20m south-southwest compared to up to 45m in the period from 2010 to 2013. The depth along this sandwave measured in 2016 has become shallower at 28.1m, compared to 28.5m in 2013; however, this location no longer acts as the controlling depth in the DWR T Focused area, as illustrated in Figure 6.

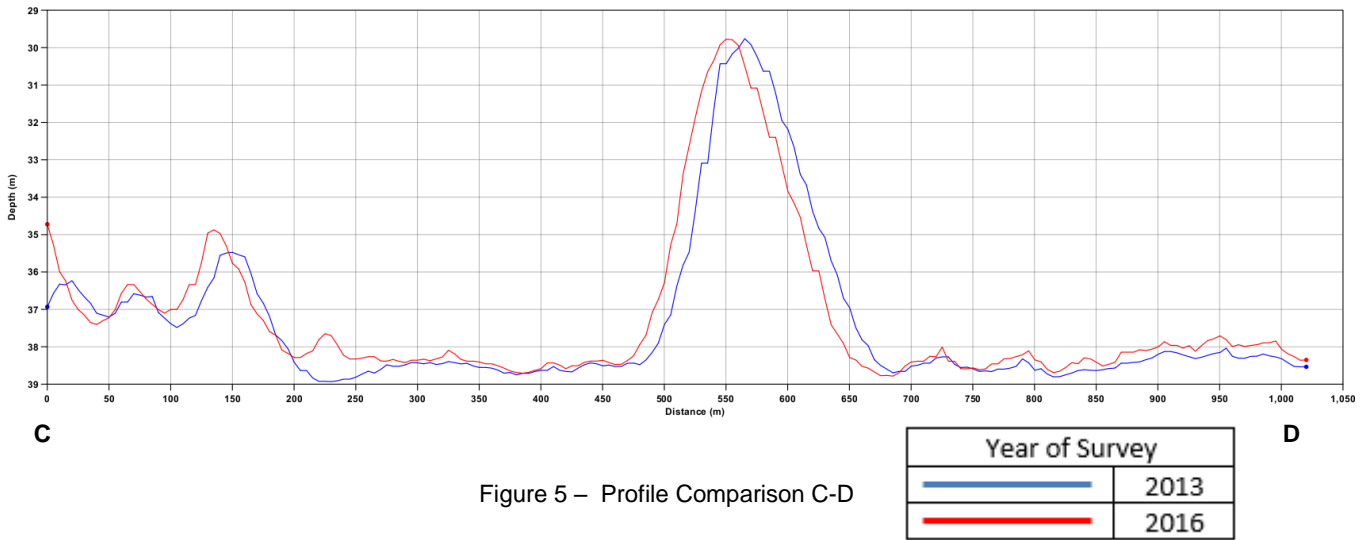
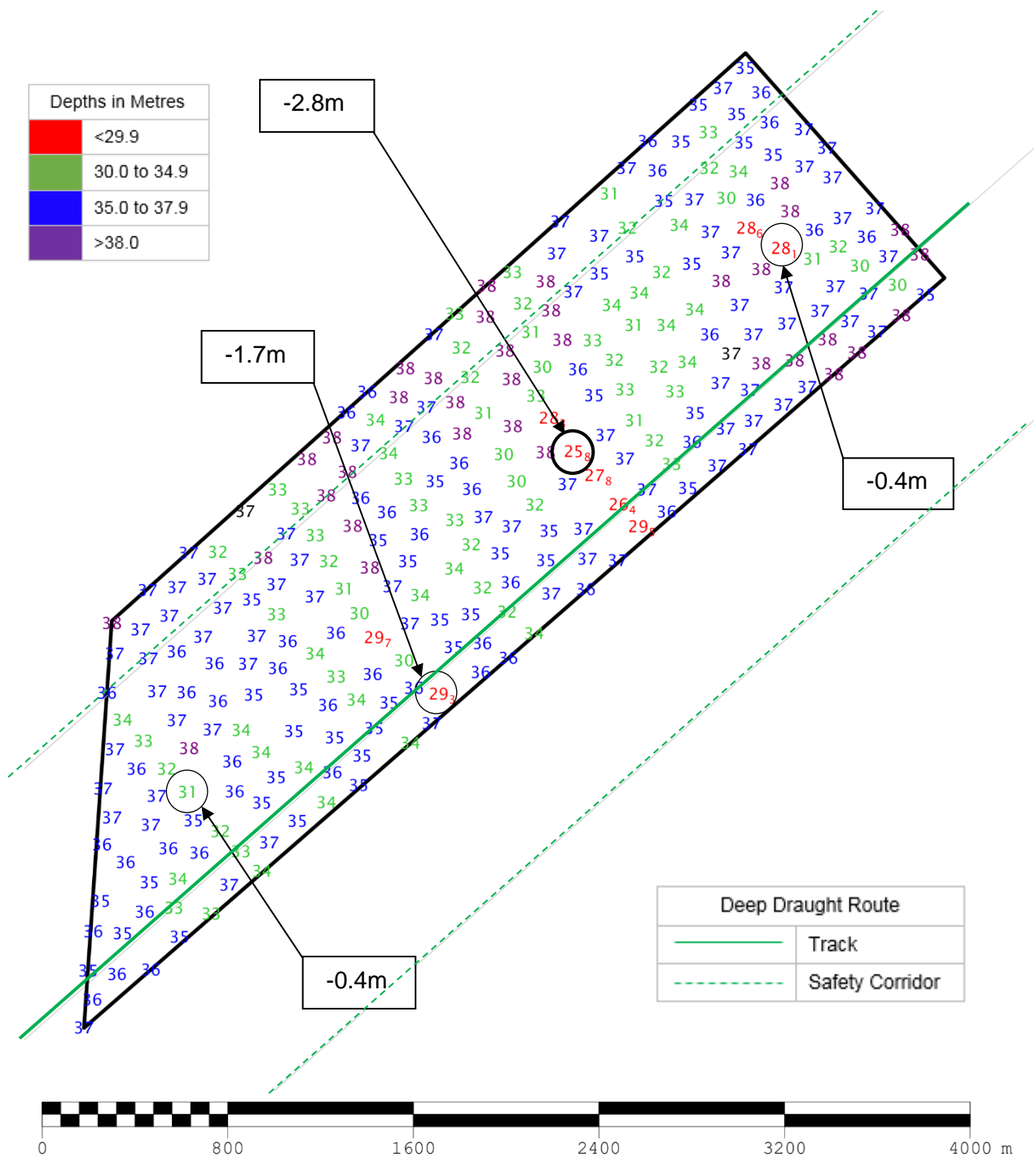


Figure 5 – Profile Comparison C-D



Depth changes indicated above are from the closest corresponding 2013 sounding available. Hence depth differences will be from different positions from the 2016 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. Positive values (+) represent deepening. Negative values (-) represent seabed depths becoming shallower.

Figure 6 – Depth Plot showing Sounding selection from the 2016 Survey, with significant changes from 2013 highlighted. The controlling depth over the area is circled in bold.

9. IMPLICATIONS FOR SHIPPING

- 9.1 The largest draught vessel recorded by the AIS data in 2016 was 23.1 meters, and passed approximately 150m to the north east of the 25.8m controlling depth in the survey area, within the Deep Water Route's corridor.
- 9.2 The controlling depth in the area is 3.7m shallower than what is considered a critical depth (29.5m) for a vessel with a draught of 23.1m, transiting through area DWR T.

10. RECOMMENDATIONS FOR FUTURE SURVEYS

- 10.1 Due to the significant shoaling in the area and intersection of the TSS and Deep Water Route the interval for resurveying the Focused Area of DWR T should be reduced to every 2 years with resurveyed scheduled for 2018
- 10.2 The south-eastern limits of the area should be extended south-eastwards to cover the extent of the largest sandwave in the area as shown in Figure 8, This is due to the significant decrease in the controlling depth, and its proximity to the recommended track for deep draught vessels.

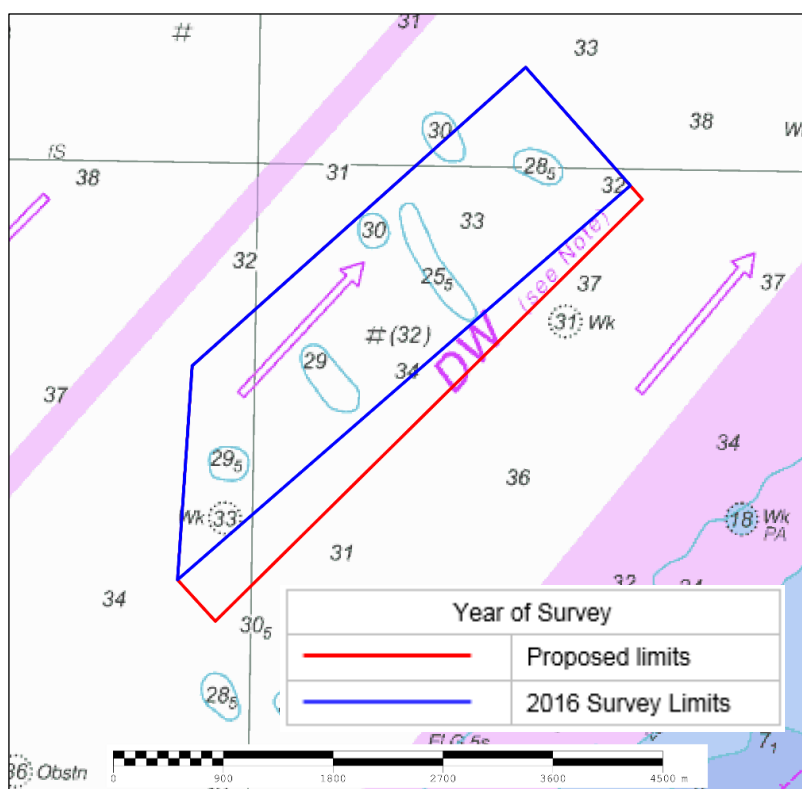


Figure 8 – Proposed change to the extent of DWR T focused area

The coordinates of the adjusted survey area limits for the Focused area DWR T shown above will lead to an increase in the survey area of 0.45 NM² 1.54 km².

DWR T focused area with the revised limits: 2.02 NM² / 6.94 km²

A	51.25730N	1.86450E
B	51.24769N	1.87843E
C	51.21609N	1.82912E
D	51.21910N	1.82460E
E	51.23490N	1.82592E