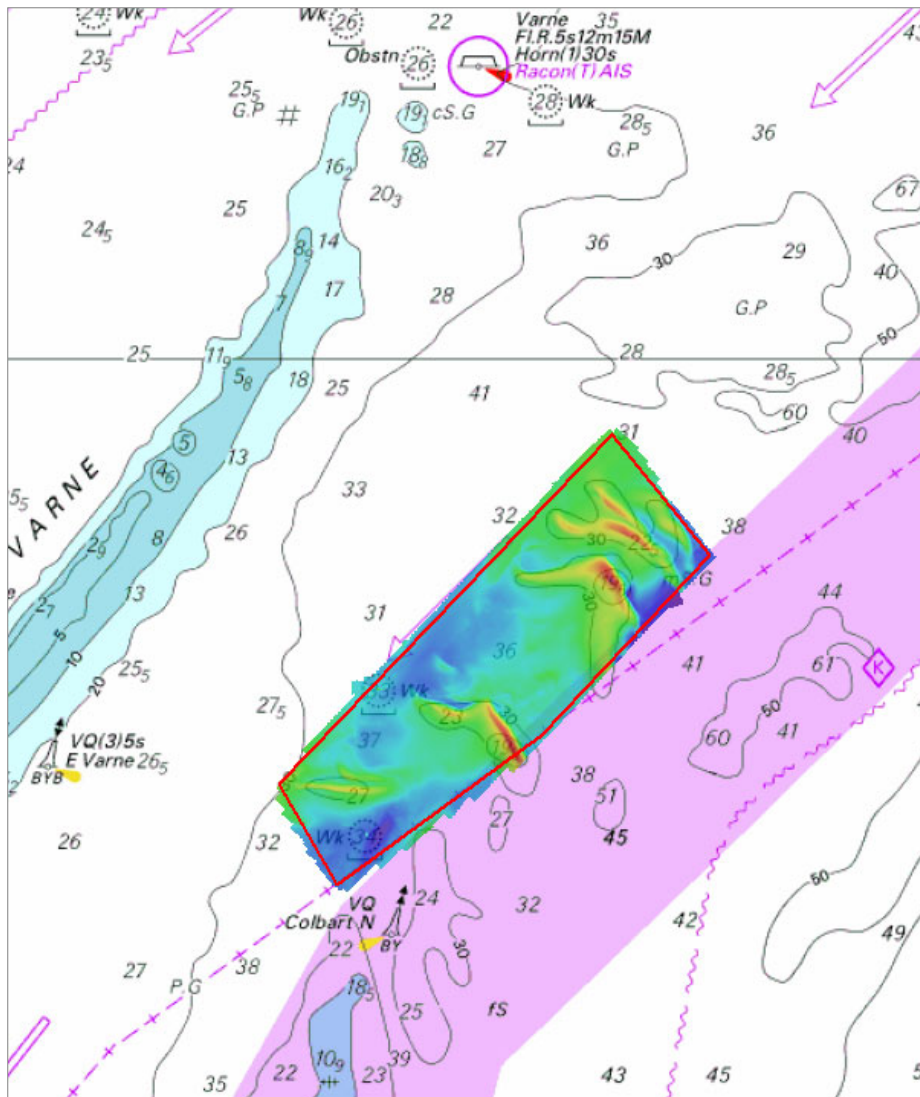




DOVER STRAIT

NORTH HEAD OF LE COLBART

ASSESSMENT ON THE ANALYSIS OF
ROUTINE RESURVEY AREA DS1
FROM THE 2013 SURVEY



DOVER STRAIT

NORTH HEAD OF LE COLBART

Assessment DS1/2013

A summary assessment of the 2013 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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NORTH HEAD OF LE COLBART, 2013

1 EXECUTIVE SUMMARY

The Area and Recent Changes

- 1.1 Area DS1 is currently surveyed on a 6-year cycle under the Civil Hydrography Programme.
- 1.2 It covers several broad, widely spaced sandwaves that lie to the north of Le Colbart and covers part of a Deep Draught Route's 1 Nautical Mile wide safety corridor. Sample AIS data shows deep draught vessels, drawing up to 22.5 metres, transiting just inside DS1.
- 1.3 There is no consistent shoaling or deepen over the sandwaves. In the north of the area the minimum depth has reduced from 20.6 to 19.6 metres, while further south a sandwave has deepened by over 2 metres.
- 1.4 Sandwaves have migrated north-eastwards by up to 35 metres (average 5m/yr).

Reasons for Continuing to Resurvey the Area

- 1.5 The area covers sandwaves, up to 14 metres in height and covers part of the south-west bound Deep Water Route.

Recommendations

- 1.6 Very deep draught vessels pass clear of the shallowest depths in DS1 and seabed mobility does not support continued resurveying on a 6-year frequency. However, given the draught of vessels using the area, depth of water and sandwave variability, it is recommended that the area remains in the programme with unchanged limits, but with a 12-year resurvey frequency.

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 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 DfT (including the MCA) and the MOD (including the UKHO).

3 HISTORY

- 3.1 In 1998, the Committee on Shipping Hydrography (COSH) determined that potential new areas for the Routine Resurvey Programme should be investigated. DS1 was one of five areas identified covering part of a south-west bound Deep Draught Route (DDR).
- 3.2 First surveyed in 1999, it was re-surveyed again the following year after which a 6-year survey interval was approved with revised limits. The area was re-surveyed as part of the full Dover Strait survey conducted in 2006-07.
- 3.1 The initial area primarily covered a shoal area north of Le Colbart that fell within the 1 Nautical Mile safety corridor of the DDR. In 2008, a waypoint was removed from the route

following the relocation of a submarine wreck. This realignment moved the route to the north-west, reducing the extent of the safety corridor which fell within the area.

4 DESCRIPTION OF THE AREA

- 4.1 DS1 lies to the north of Le Colbart bank in the south-west bound lane of the Dover Strait TSS. It comprises an area of 1.4 sq NM (4.8 sq km).
- 4.2 The area contains several broad, widely spaced sediment waves of predominantly sandy sediments up to 14 metres in height.
- 4.3 Details of the area, including the survey history, are at [Annex A](#). The limits are shown at [Annex B](#), along with implied sediment transport based on sandwave asymmetry.

5 SHIPPING IN THE AREA

- 5.1 Shipping routes, based on sample AIS data are shown at [Annex C](#). A suggested route for deep draught vessels passes to the south of The Varne. Although the route and 1 Nautical Mile safety corridor has no formal standing, the Department for Transport's recommended under-keel allowance for deep draught vessels using this part of the route and travelling at 12 knots is 6.1 metres when under the influence of storm waves and swell. Under-keel allowances include a combined element to allow for vessel draught uncertainties and uncertainties in seabed level due to sandwaves, tidal reduction of surveys and survey instrumentation / interpretation inaccuracies. When DS1 was established a waypoint taking vessels further to the south, through DS1, was in place but this waypoint was removed in 2008 following the relocation of a wreck.
- 5.2 Sample AIS data indicates around 40 vessels a year transit the area drawing 20 metres or more, these vessels are shown to adopt a more direct route than the suggested route and well to the south-east of the waypoint that lies north of DS1. Vessels drawing up to 22.5 metres have been observed transiting just inside DS1; further east, towards shallower depths and the traffic separation zone, vessels drawing up to 17.4 metres have been observed. Of the deep draught vessels examined, all have transited with 2.3 metres or more of tide.

6 2006 SURVEY DETAILS

- 6.1 The area was surveyed as part of a much wider survey of the Dover Strait, commencing work in 2006 and completing in 2007. Much of the survey was run later in the year than usual and will potentially produce deeper depths over sandwaves due to the effects of winter storms.
- 6.2 Positioning was by DGPS. A tidal model was established using the Dover Tide Station supported by two independent offshore stations. One was situated near Beachy Head and the other near South Galloper Bank.
- 6.1 The assessed accuracy of depth measurements met IHO S-44 (4th Edition) Order 1. However, comparison against the 2013 survey indicates the 2006 survey is approximately 0.6 metres shallower in the more stable areas in the central and southern areas; the survey is also shallower than surveys conducted in 1999 and 2000, but to a lesser extent.

7 2013 SURVEY DETAILS

- 7.1 The survey was conducted on 10 and 11 December, in conjunction with other areas.

- 7.2 Depths in the survey were reduced to Chart Datum using GPS heights, with ellipsoidal height to chart datum taken from the Vertical Offshore Reference Framework (VORF). The survey achieved IHO S-44 (5th Edition) Order 1a standard.
- 7.3 In both surveys, full seafloor cover with multibeam was achieved.

8 DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 8.1 Colour banded depth plots of the 2006 and 2013 surveys are at [Annexes D](#) and [E](#) respectively and allow a comparison of depth values.
- 8.2 A variability plot, at [Annex F](#), shows the changes in depth between the 2006 and 2013 surveys. The variability plot indicates an apparent depth offset between the two surveys. The 2006 survey consists of discreet blocks and DS1 is covered by Blocks 7 and 8. Block 8, covering the northern area is approximately 0.2 metres shallower than the 2013 survey; Block 7, covering the central and southern part of the area is approximately 0.6 metres shallower than the 2013 survey. For the variability plot only, a block shift of 0.4 metres has been applied to Block 7 data to bring it into agreement with Block 8 and the results are shown at [Annex G](#).
- 8.3 The variability plot shows the north-east migration that has occurred, as shown in the cross-sections at [Annex B](#), with sandwaves migrating up to 35 metres (average 5m/yr).
- 8.4 A comparison plot of the 27 metre contour is at [Annex H](#).
- 8.5 There is no consistent shoaling or deepen over sandwaves. In the north of the area the minimum depth has reduced from 20.6 to 19.6 metres. Towards the south of the area a sandwave has increased from 23.3 to 26.1 metres, which after taking into account the shoal offset of the 2006 survey in that area still gives a deepening of over 2 metres.

9 IMPLICATIONS FOR SHIPPING

- 9.1 Although the 2013 surveys minimum depth of 19.6 metres is 1 metre shallower than previously charted depth over the sandwave, the depth falls outside the DDR, with deeper water available to the west.
- 9.2 Only one sandwave falls partially within the DDR 1 Nautical Mile safety corridor, and depths in both surveys are in excess of 27 metres within the corridor.

10 RECOMMENDATIONS FOR FUTURE SURVEYS

- 10.1 Very deep draught vessels pass clear of the shallowest depths in DS1 and seabed mobility does not support continued resurveying on a 6-year frequency. However, given the draught of vessels using the area, depth of water and sandwave variability, it is recommended that the area remains in the programme with unchanged limits but with a 12-year resurvey frequency.

AREA SPECIFICATIONS
(Including Survey History)

REGION: Dover Strait**NAME:** North Head of Le Colbart**AREA:** DS1**LIMITS:**

A	50.97220°N	1.40590°E
B	50.96120°N	1.38200°E
C	50.96860°N	1.37525°E
D	50.99439°N	1.41400°E
E	50.98548°N	1.42537°E

Area co-ordinates are referred to WGS84 Datum

AREA SIZE: 1.4 sq NM (4.8 sq km)**SURVEY INTERVAL:** 6 yr**SURVEYS:** (conducted at 1:25,000 scale (not applicable to multibeam surveys))

Year	Survey	Data
1999	HI855	d.s
2000	HI897	d.s
2006	HI1159	m
2013	HI1434	m

KEY: s = sonar sweep, d = digital data, m = multibeam digital data

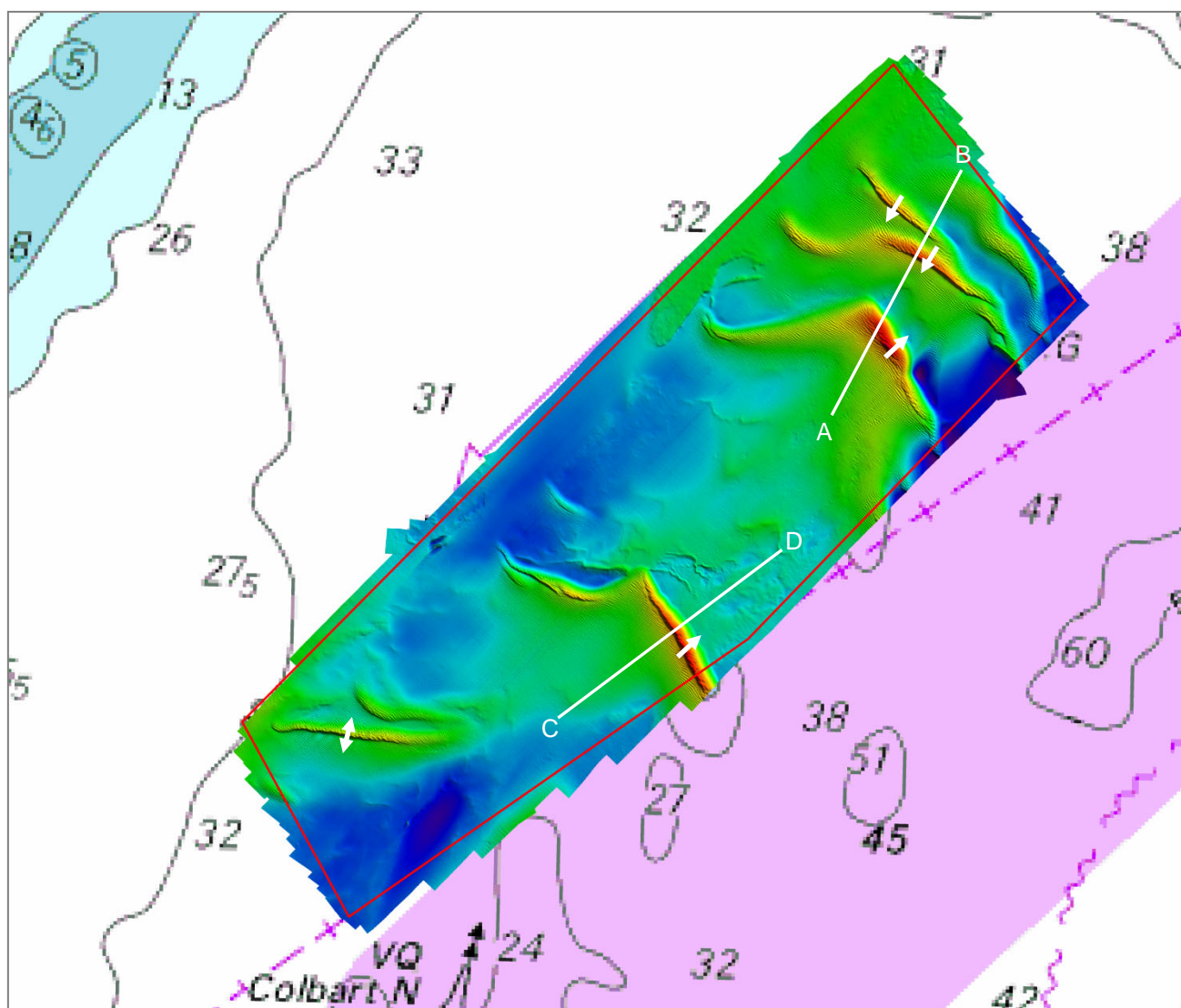
REPORTS: 2000 First survey of DS1 assessed against a 1988 analogue survey
2002 Latest survey assessed

ASSESSMENTS: none

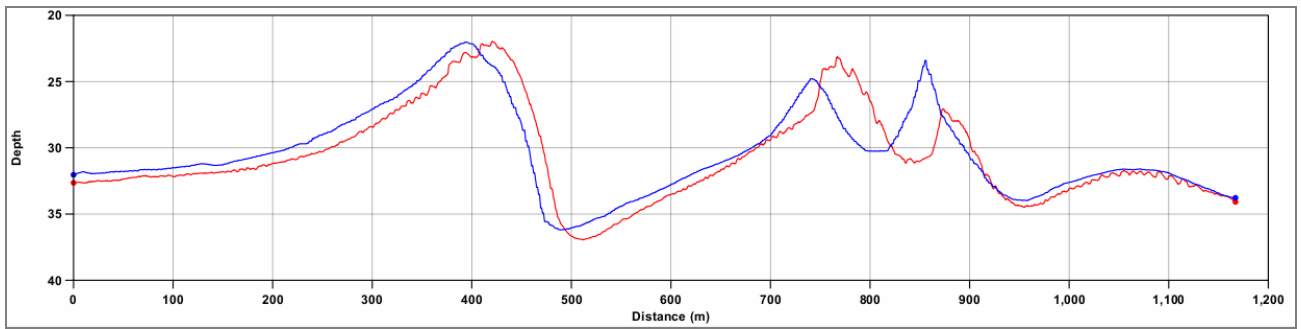
REMARKS: 1998 Area DS1 established
2002 6-year survey frequency established with revised limits

LARGEST SCALE CHART: BA 1892

SUN ILLUMINATED VIEW OF THE 2013 SURVEY OVERLAID ON CHART 1892
AND CROSS SECTION COMPARISONS



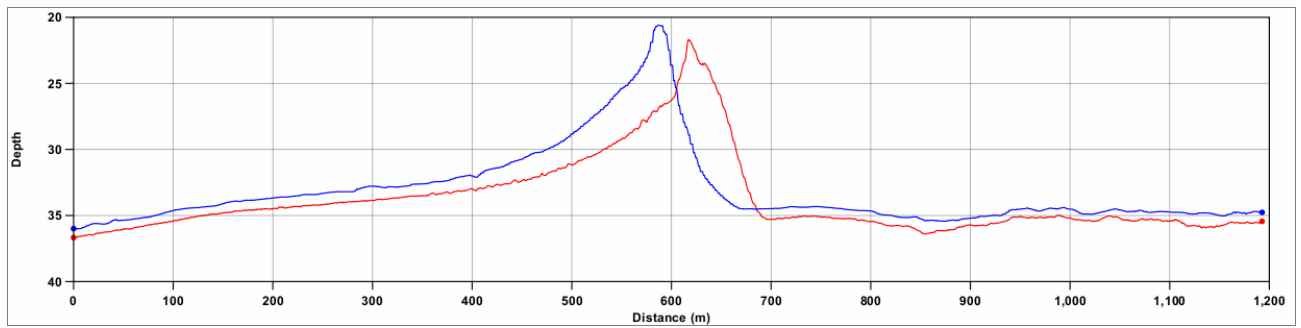
Sediment transport based on
sandwave asymmetry



A

Profile A-B

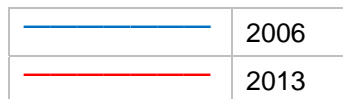
B



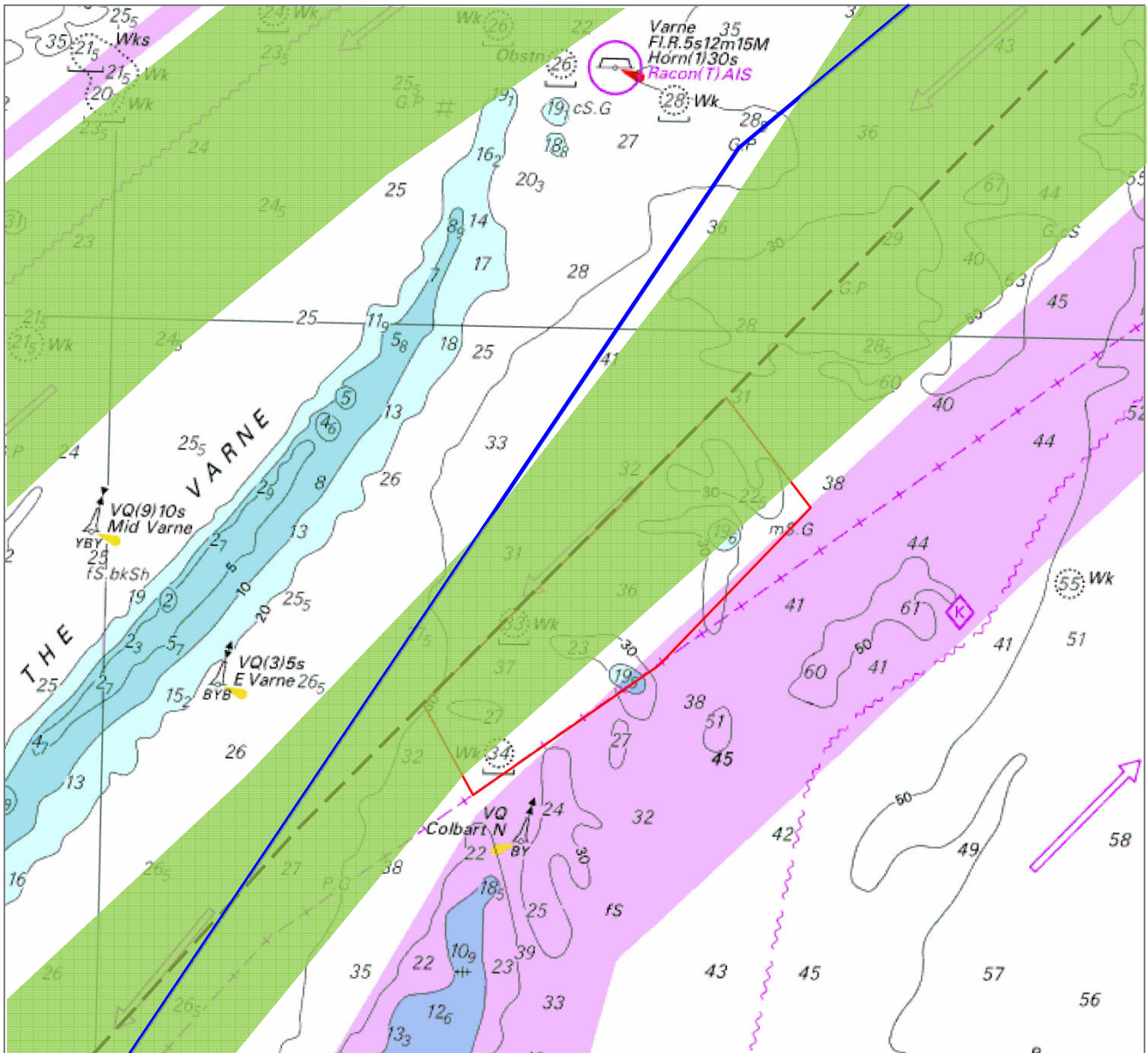
C

Profile C-D

D





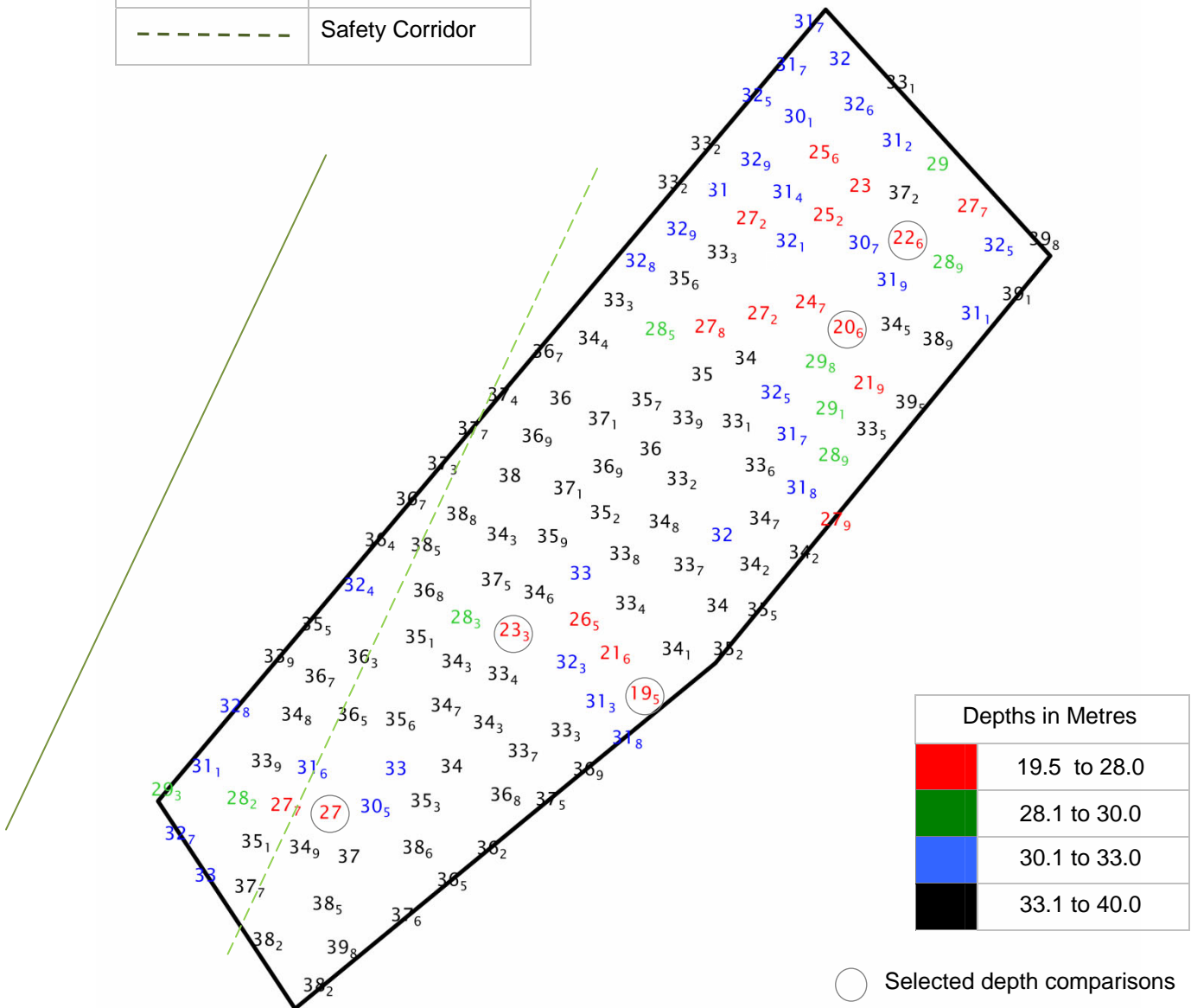
SHIPPING ROUTES







- Main shipping routes based on sample AIS data
- Indicative track of very deep draught vessels (>20m)
- Suggested Deep Draught Track

COLOUR BANDED DEPTH PLOT
 FROM THE 2006 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:25,000

Deep Draught Route	
	Track
	Safety Corridor





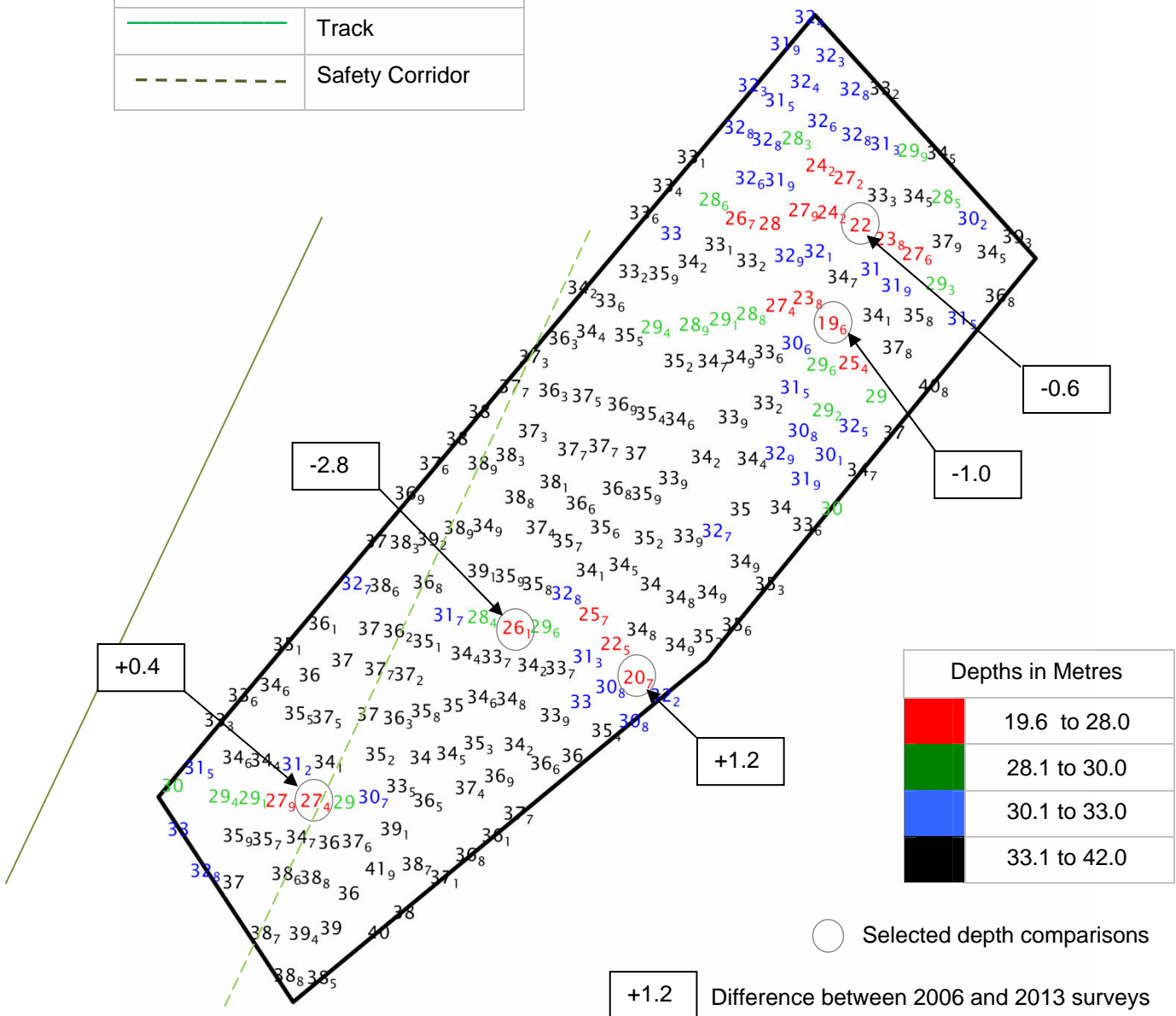
Depths in Metres	
	19.5 to 28.0
	28.1 to 30.0
	30.1 to 33.0
	33.1 to 40.0

 Selected depth comparisons

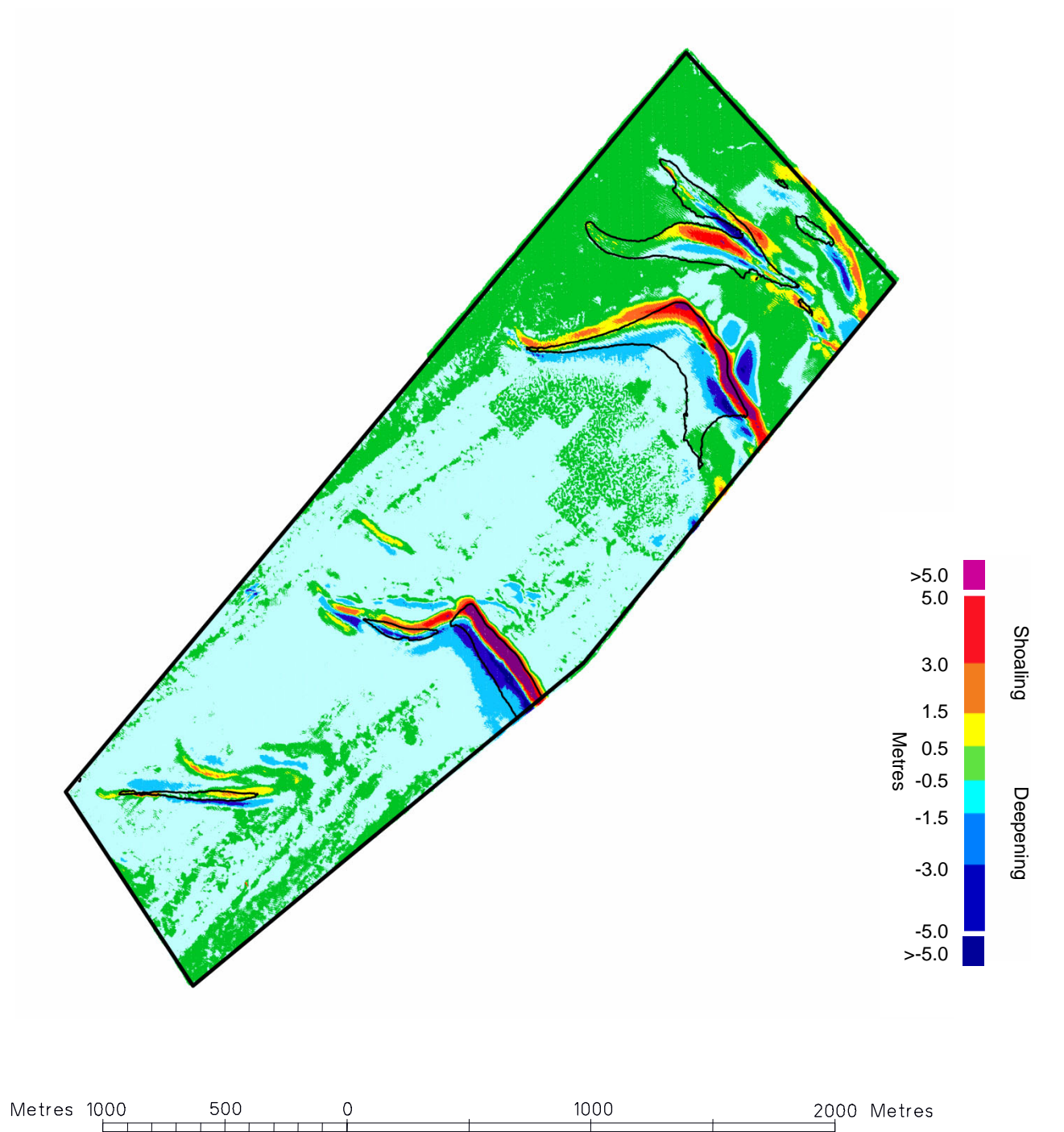


COLOUR BANDED DEPTH PLOT
 FROM THE 2013 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:25,000

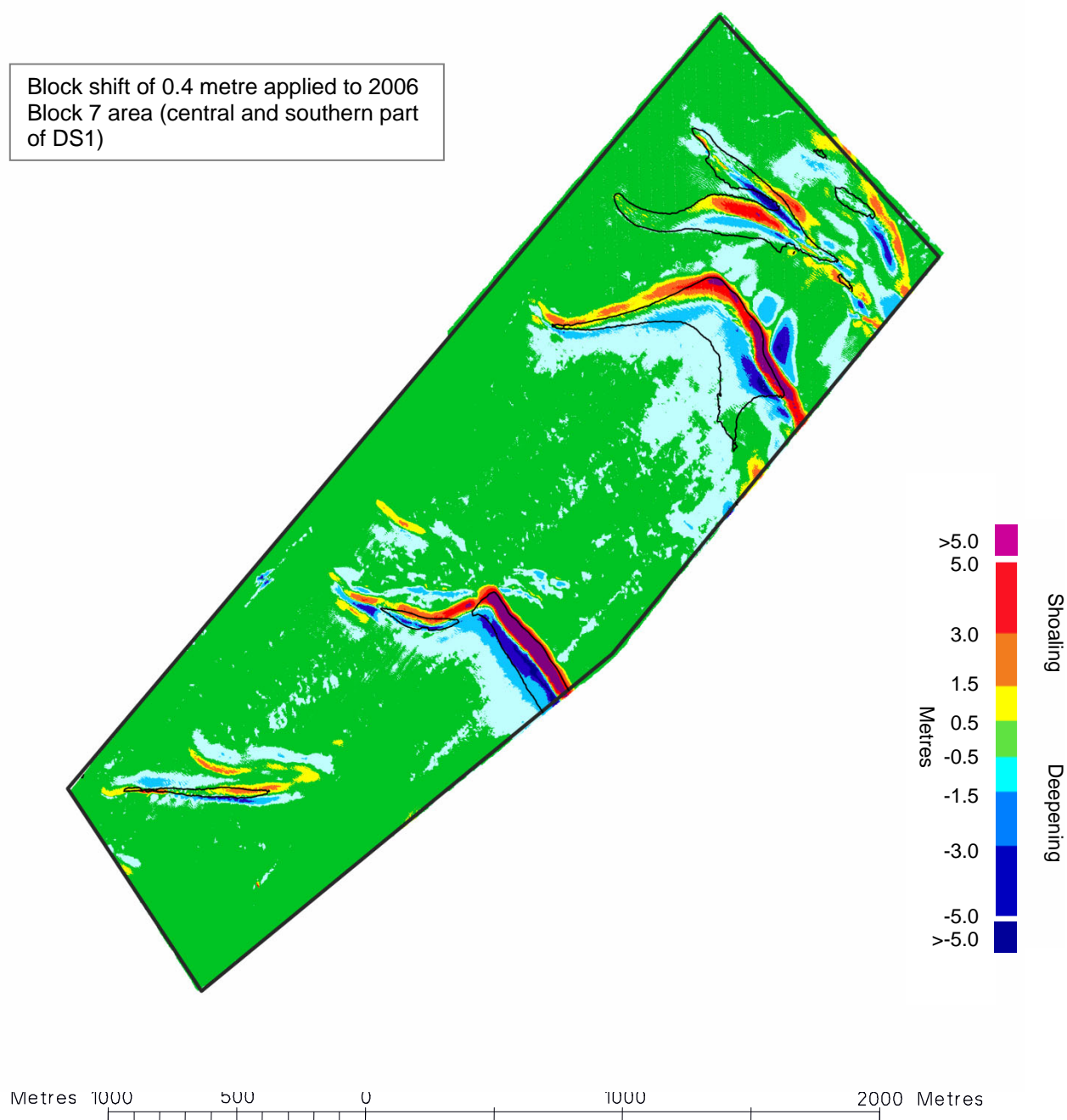
Deep Draught Route	
	Track
	Safety Corridor



VARIABILITY PLOT SHOWING
BATHYMETRIC CHANGES BETWEEN THE 2006 AND 2013 SURVEYS
AND CHARTED CONTOURS FROM THE 2013 SURVEY
SCALE 1:25,000

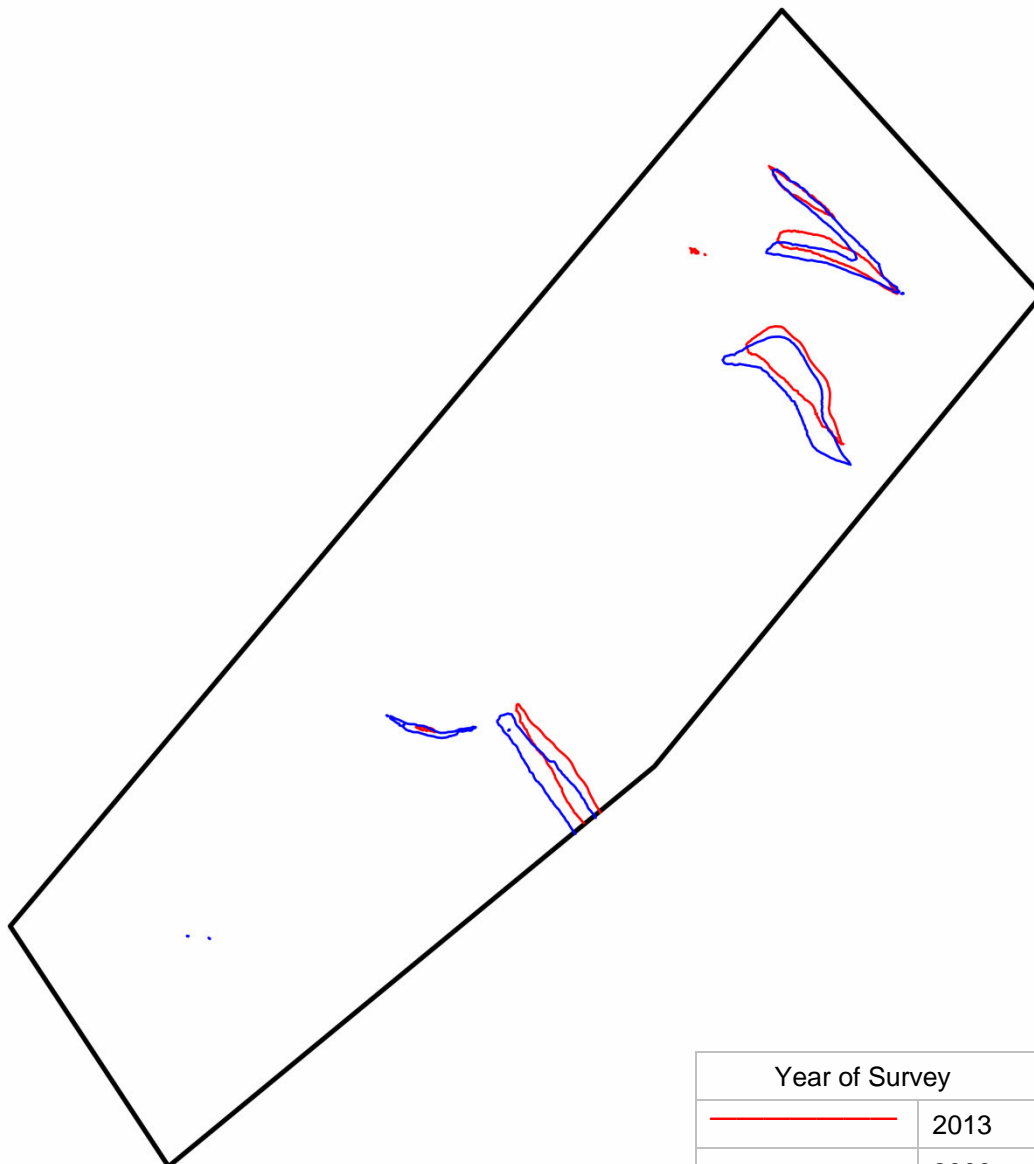




VARIABILITY PLOT SHOWING
BATHYMETRIC CHANGES BETWEEN THE
2006 (SHIFTED) AND 2013 SURVEYS
AND CHARTED CONTOURS FROM THE 2013 SURVEY
SCALE 1:25,000



COMPOSITE DIAGRAM OF THE
27 METRE CONTOUR FROM THE 2006 AND 2013 SURVEYS

SCALE 1:25,000



Year of Survey	
	2013
	2006