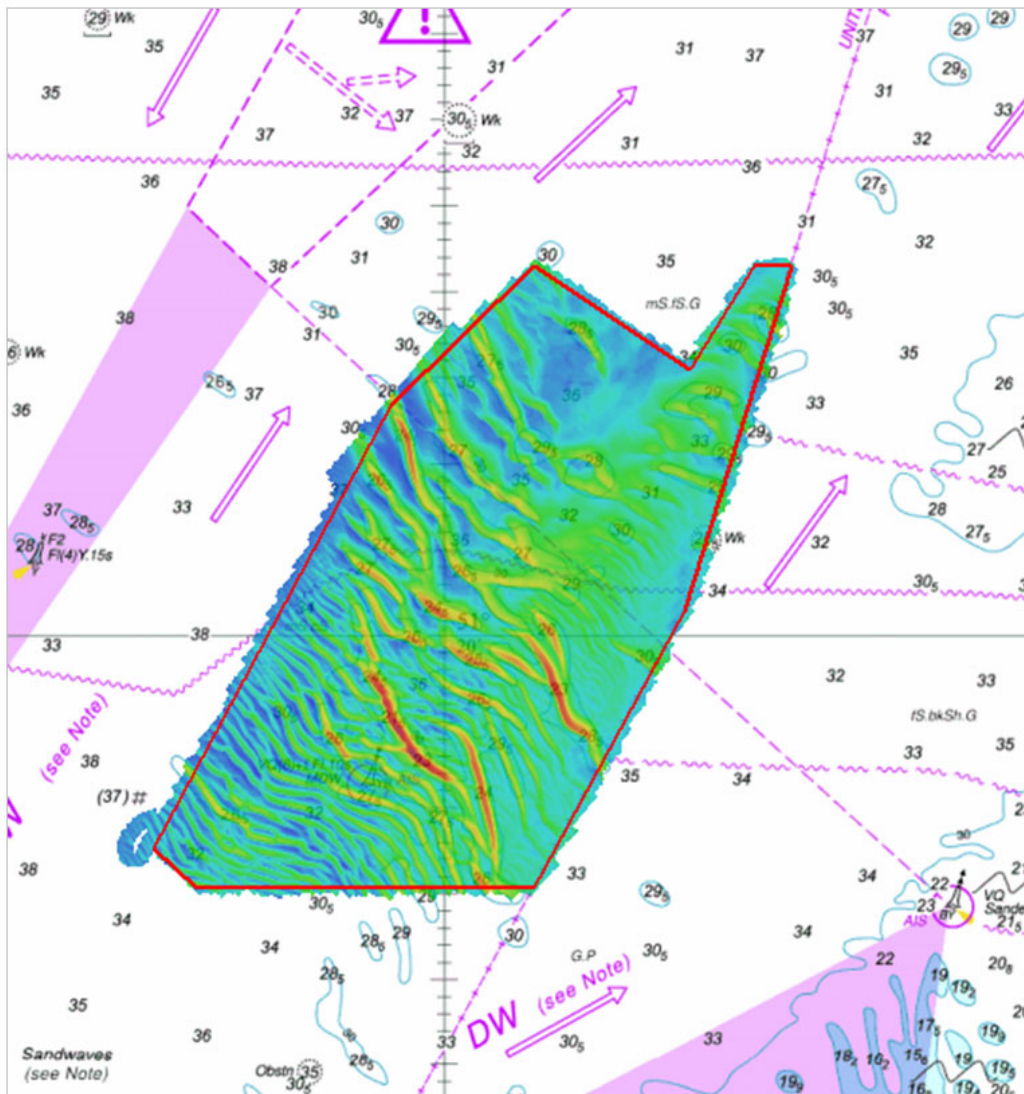




DOVER STRAIT

NORTH WEST SANDETTIE

SUMMARY ASSESSMENT ON THE ANALYSIS OF ROUTINE RESURVEY AREA DWR B2 FROM THE 2013 SURVEY



DOVER STRAIT

NORTH WEST SANDETTIE

Assessment DWR/B2 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 WEST SANDETTIE, 2013

1 EXECUTIVE SUMMARY

The Area and Recent Changes

- 1.1 Area DWR B2 is currently surveyed on a 6-year cycle under the Civil Hydrography Programme.
- 1.2 It lies within the Sandettié Deep Water Route (DWR) to the north-west of Sandettié Bank.
- 1.3 Minimum depths over sandwaves are broadly similar to those in the 2006 survey and examination of surveys back to 1986 shows little variation in the depths over shoal sandwaves.

Reasons for Continuing to Resurvey the Area

- 1.4 The area covers large sandwaves up to 15 metres in height and covers part of the north-east bound Deep Water Route.

Recommendations

- 1.5 It is recommended that the re-survey frequency of much of the area is extended from 6 to 12 years, with a focused area covering the shallowest area transited by deep draught shipping retained as a 6-year focused survey area. The proposed limits are shown at [Annex J](#).
- 1.6 This focused area should be surveyed in conjunction with the adjacent 6-year focused area in DWR R.

2 INTRODUCTION

- 2.1 This Assessment is produced by the United Kingdom Hydrographic Office (UKHO), on behalf of the Ministry of Defence (MOD), for the Maritime and Coastguard Agency (MCA), on behalf of the Department for Transport (DfT).
- 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 The area was established in 1984, when an Understanding between the Hydrographers of the Netherlands, Belgium, France and the United Kingdom was reached on national responsibilities for hydrographic surveying in the southern North Sea and Dover Strait. In effect the Understanding modified the surveying limits that would be delineated by official territorial waters / continental shelf boundaries in order to ensure that efficient and coherent surveys were conducted.
- 3.2 The first report was produced in 1987 and reviewed the then area B. It concluded that there were two distinct areas of interest requiring different survey intervals, and the area was divided into areas DWR B1 and B2, which were to be surveyed at 3 and 6 year intervals respectively. Area DWR B1 has since been incorporated into area DWR R.

- 3.3 Reports in 1997 and 2002 retained the survey interval and limits. Prior to commencing the 2013 survey, routine resurvey areas in the Dover Strait and Deep Water Route were revised to remove those areas covering French waters and the limits of DWR B2 were reduced slightly.

4 DESCRIPTION OF THE AREA

- 4.1 DWR B2 lies to the north of Sandettié Bank, in the north-east bound lane of the Dover Strait TSS, in an area designated by the IMO as a Deep Water Route. It comprises an area of 7.5 sq NM (25.6 sq km).
- 4.2 The seabed comprises mainly of coarse sand and some fine sand with shell and pebbles. An extensive sandwave field dominates the area, with sandwaves up to 15 metres in height and generally orientated NW/SE.
- 4.3 The largest sandwaves occur in the southern part of the area, close north-east of MDW buoy.
- 4.4 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 The area is used by deep draught vessels travelling in a north-east direction along the north-east bound traffic lane and in the north of the area crossing the traffic lane, as shown at [Annex C](#).
- 5.2 Most of the north-east bound vessels pass to the west of MDW buoy, but a small number are shown passing to the east and drawing up to 17 metres.
- 5.3 Very deep draught vessels using the traffic lane generally pass to the west of DWR B2, where there is a recommended Deep Draught Route for vessels with a draught from 20.7 to 22.6 metres. However, vessels drawing up to 20.9 metres are shown using the western side of DWR B2. [Annex C](#) shows the area used by vessels with a draught of 18.0 to 20.9 metres in sample AIS data; most of these are shown transiting the area on an ebb tide with 2.5 metre or less of tide.
- 5.4 The British Authorities recommended under-keel allowances for the 'Selected Route' to the west is 6.4 metres. This is based on a 22 metre draught vessel making passage in Southwest storm conditions at 12 knots. It takes into account movement due to storm waves and swell; uncertainties in charted depths and vessel's draught; risk of negative surges and squat of 1 metre at a speed of 12 knots.
- 5.5 Vessels crossing the north of the area have lesser draught, with a maximum observed draught of 14.2 metres.

6 2006 SURVEY DETAILS

- 6.1 The area was surveyed as part of a much wider survey of the Dover Strait, commencing 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.
- 6.3 The survey achieved IHO S-44 (4th Edition) Order 1 standard.

7 2013 SURVEY DETAILS

- 7.1 The survey was conducted between 15 November and 10 December, in conjunction with other areas and with standby periods due to variable weather conditions.
- 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 was supplied as a Combined Uncertainty Bathymetry Estimator (CUBE) surface at 1 metre resolution and achieved IHO S-44 Order (5th Edition) 1a standard.
- 7.3 In both surveys, full seafloor cover with multibeam was achieved. Examination of relatively stable areas of DWR B2 indicates that depths in the 2013 survey are approximately 0.2 metres deeper than those in the 2006 survey, most likely due to difference in tidal reduction method and difference between the 2006 shoal biased surface and 2013 CUBE surface.

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.
- 8.3 Comparison plots of the 27 and 30 metre contours are at [Annexes G](#) and [H](#).
- 8.4 The variability plot mainly reflects migration of sandwaves, although migration is limited with sandwaves generally migrating in a south-west direction by up to 5 m/yr. Minimum depths over selected sandwaves are broadly similar, but with a sandwave in the north-west of the area shallower by 0.8 metres.
- 8.5 Long-term variability has been looked at by examining depths over selected sandwaves back to 1986. Table 8.1 and figure 8.1 show little variation in the depths over these sandwaves. In the five shoal sandwaves, the maximum observed range in depths is 1.2 metres.
- 8.6 There is no clear evidence of long-term shoaling or deepen over sandwaves.

Year	A	Chart Depth	B	Chart Depth	C	Chart Depth	D	Chart Depth	E	Chart Depth
1986	25.5	25.5	21.6	21.5	24.7	24.5	23.7	23.5	29.2	29.0
1987	25.7	25.5	22.3	22.0	25.2	25.0	24.2	24.0	29.5	29.5
1988	24.9	24.5	22.0	22.0	25.2	25.0	24.0	24.0	29.2	29.0
1989	25.2	25.0	21.2	21.0	24.5	24.5	23.8	23.5	28.8	28.5
1995	25.3	25.0	21.4	21.0	24.1	24.0	23.0	23.0	28.4	28.0
2001	25.7	25.5	21.9	21.5	24.7	24.5	23.1	23.0	28.8	28.5
2006	25.5	25.5	21.9	21.5	24.7	24.5	23.4	23.0	29.4	29.0
2013	24.7	24.5	21.9	21.5	24.3	24.0	23.4	23.0	28.8	28.5
Range	1.0	1.0	1.1	1.0	1.1	1.0	1.2	1.0	1.1	1.0

Table 8.1: Minimum depths over selected sandwaves (see Annex E for locations)

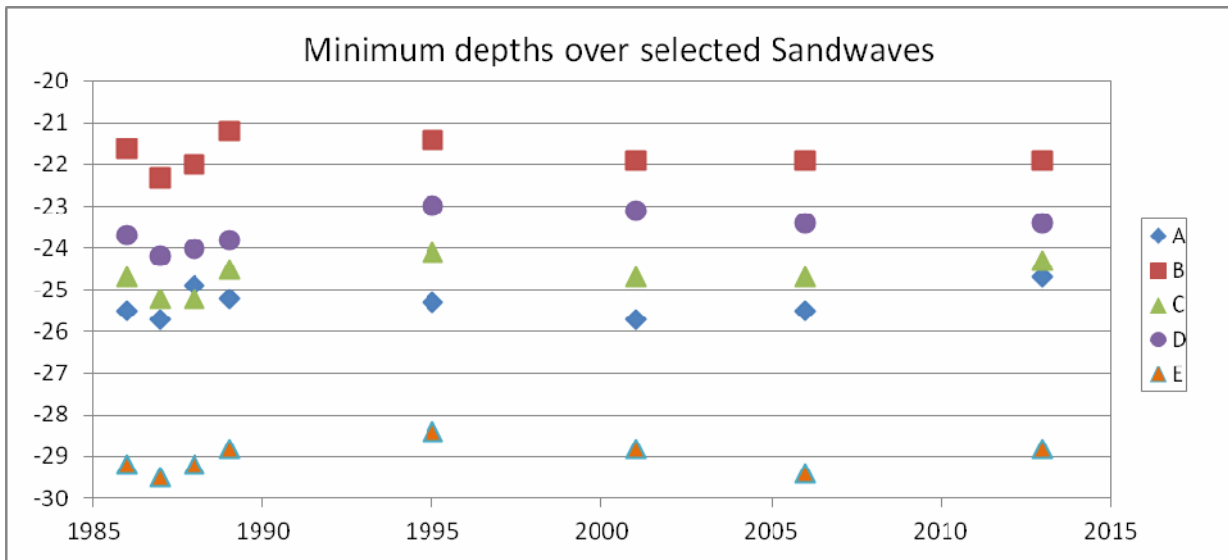


Figure 8.1: Minimum depths over selected sandwaves (see Annex E for locations)

9 IMPLICATIONS FOR SHIPPING

- 9.1 Depths across the area are generally similar to those found when surveyed 6 years ago.
- 9.2 The minimum depth in the area is 21₅ north of MDW buoy, shipping in this area is light but ships drawing up to 17.4 metres are observed passing close to the west.
- 9.3 The minimum depth in the area transited by deeper draught vessels is 24₅; shipping in this area is dense with vessels drawing up to 20.9 metres observed using the area.
- 9.4 The recommended Deep Draught Route which lies to the west of DWR B2 has a recommended Under Keel Allowance of 6.4 metres. This are based on a 22 metre draught vessel making passage in south-west storm conditions at 12 knots. It takes into account movement due to storm waves and swell, uncertainties in charted depths and vessel's draught and risk of negative surges and squat of 1 metre at a speed of 12 knots.

10 RECOMMENDATIONS FOR FUTURE SURVEYS

- 10.1 Considering the stable nature of the features and use of the area by vessels, it is recommended that the re-survey frequency for much of the area is extended from 6 to 12 years.
- 10.2 The area containing the shallowest depths within DWR B2 and shoal area transited by the deepest draught vessels should be retained as a focused area with a survey interval of 6 years. The proposed limits are shown at [Annex J](#). This area covers 27% of the full area and should be surveyed in conjunction with the adjacent 6-year focused area in DWR R.

Proposed Focused Area DWR B2 Limits:

1	51.347886N	001.985110E
2	51.355500N	001.991670E
3	51.361900N	002.002440E
4	51.340810N	002.006750E
5	51.318400N	002.006750E
6	51.318400N	001.980500E
7	51.326000N	001.980500E

AREA SPECIFICATIONS
(Including Survey History)

REGION: Dover Strait**NAME:** Northwest Sandettié**AREA:** B2**LIMITS:**

A	51.31267°N	1.95483°E
B	51.35550°N	1.99167°E
C	51.36900°N	2.01390°E
D	51.35900°N	2.03800°E
E	51.36900°N	2.04800°E
F	51.36900°N	2.05370°E
G	51.33570°N	2.03720°E
H	51.30880°N	2.01390°E
I	51.30883°N	1.96167°E

Area co-ordinates are referred to WGS84 Datum

AREA SIZE: 7.46 SQ NM (25.58 SQ km)**SURVEY INTERVAL:** 6 yr**SURVEYS:** (conducted at 1:25,000 scale (not applicable to multibeam surveys))

Year	Survey	File Ref	Data	Year	Survey	File Ref	Data
1976	K7481			1987	M1133	H4029/86	s.t
1977	K7913			1988	M1250	H6344/87	s.t.d
1978	K7970			1989	M1344	HH090/460/01	s.t.d
1981	K8495	H2820/71		1995	M2514	HH090/646/01	s.t.d
1984	K9389	H2890/83	s.t	2001	M3585	HH090/932/01	s.t.d
1985	K9715	H2347/84	s	2006/7	HI1159		m
1986	K9813	H4321/85	s	2013	HI1434		m

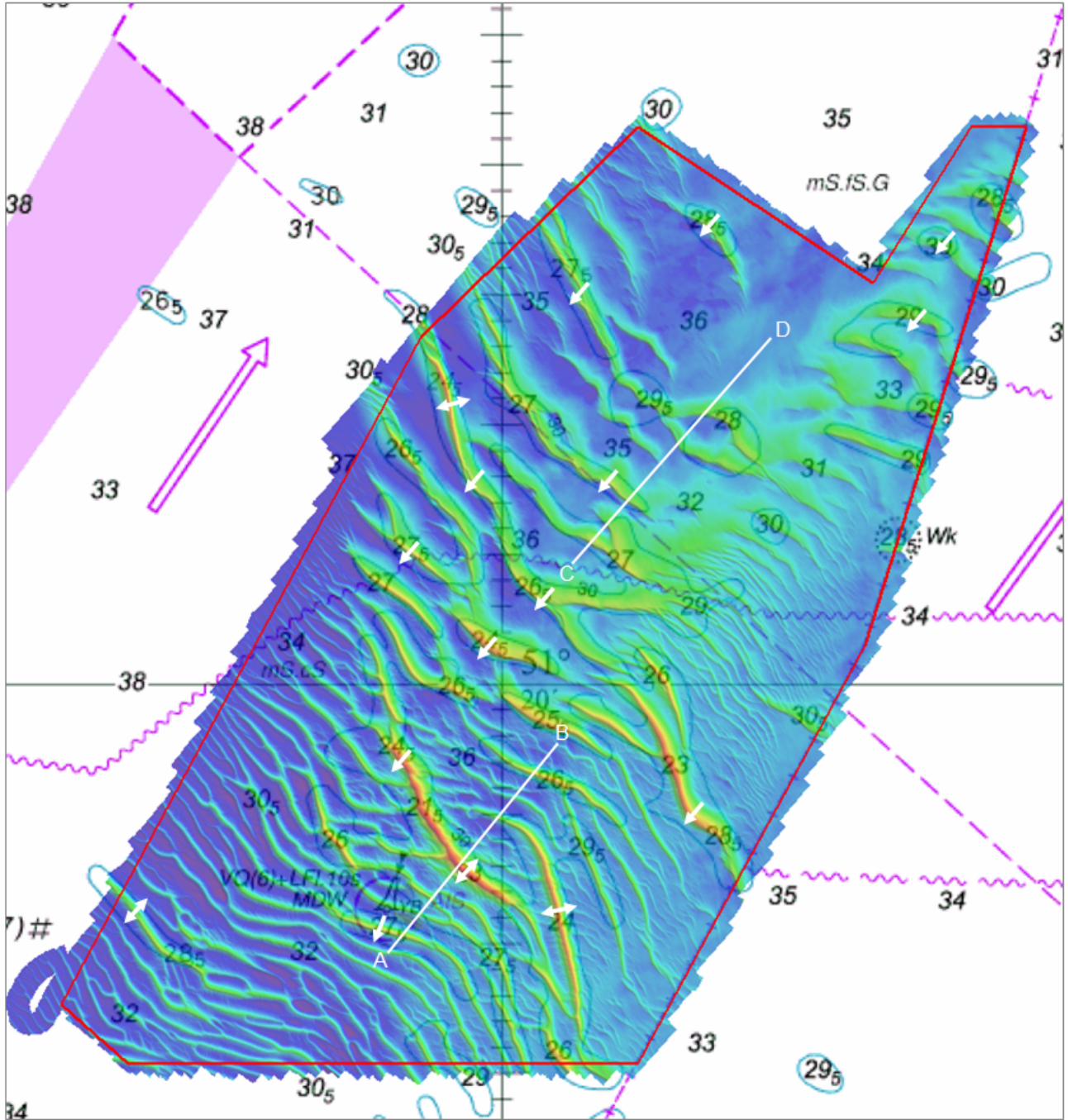
KEY: s = sonar sweep, t = seabed texture tracing, d = digital data, m = multibeam digital data

REPORTS: 1997 Latest Survey included M2514
2002 Latest Survey included M3585

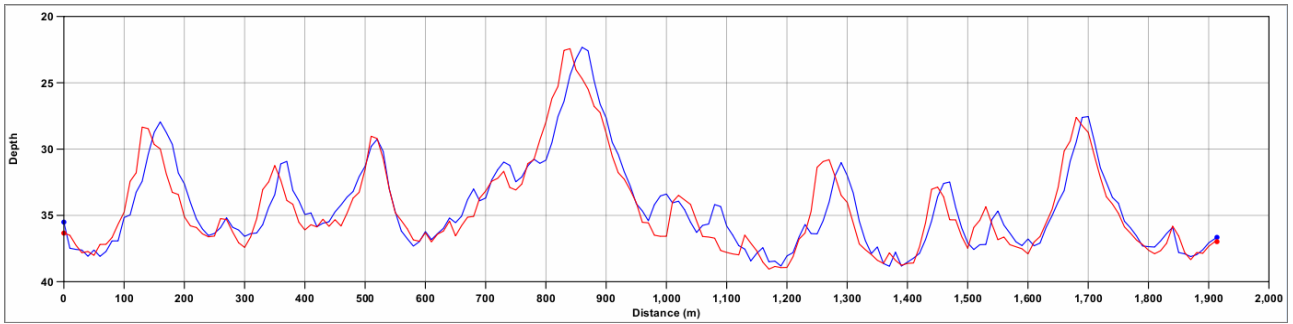
REMARKS: 1976 Report on old area B (no reference)
1984 Area B established (H6023/82-E53)
1987 Report divides area B into new areas B1 and B2 (H4782/87)
2013 Area modified slightly to exclude French waters

LARGEST SCALE CHART: BA 323

SUN ILLUMINATED VIEW OF THE 2013 SURVEY OVERLAID ON CHART 323
AND CROSS SECTION COMPARISONS



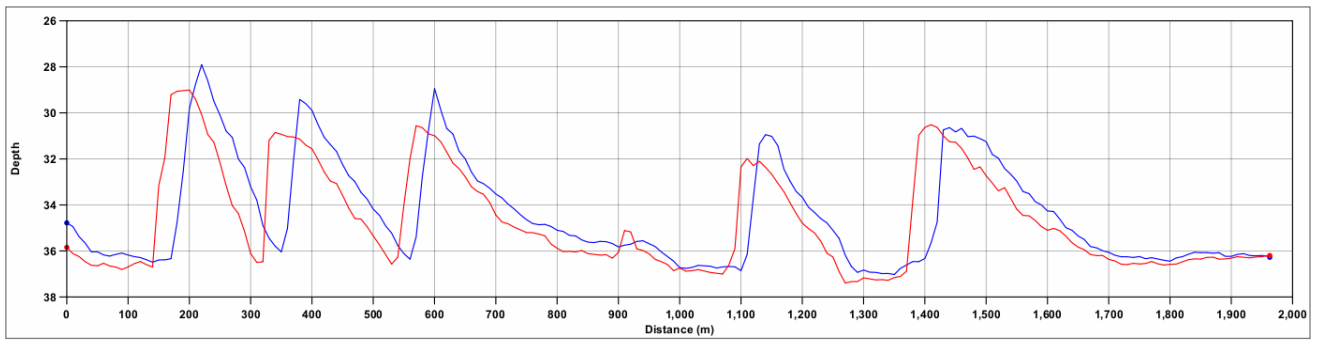
→ Sediment transport based on sandwave asymmetry



A

Profile A-B

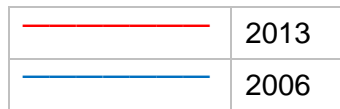
B



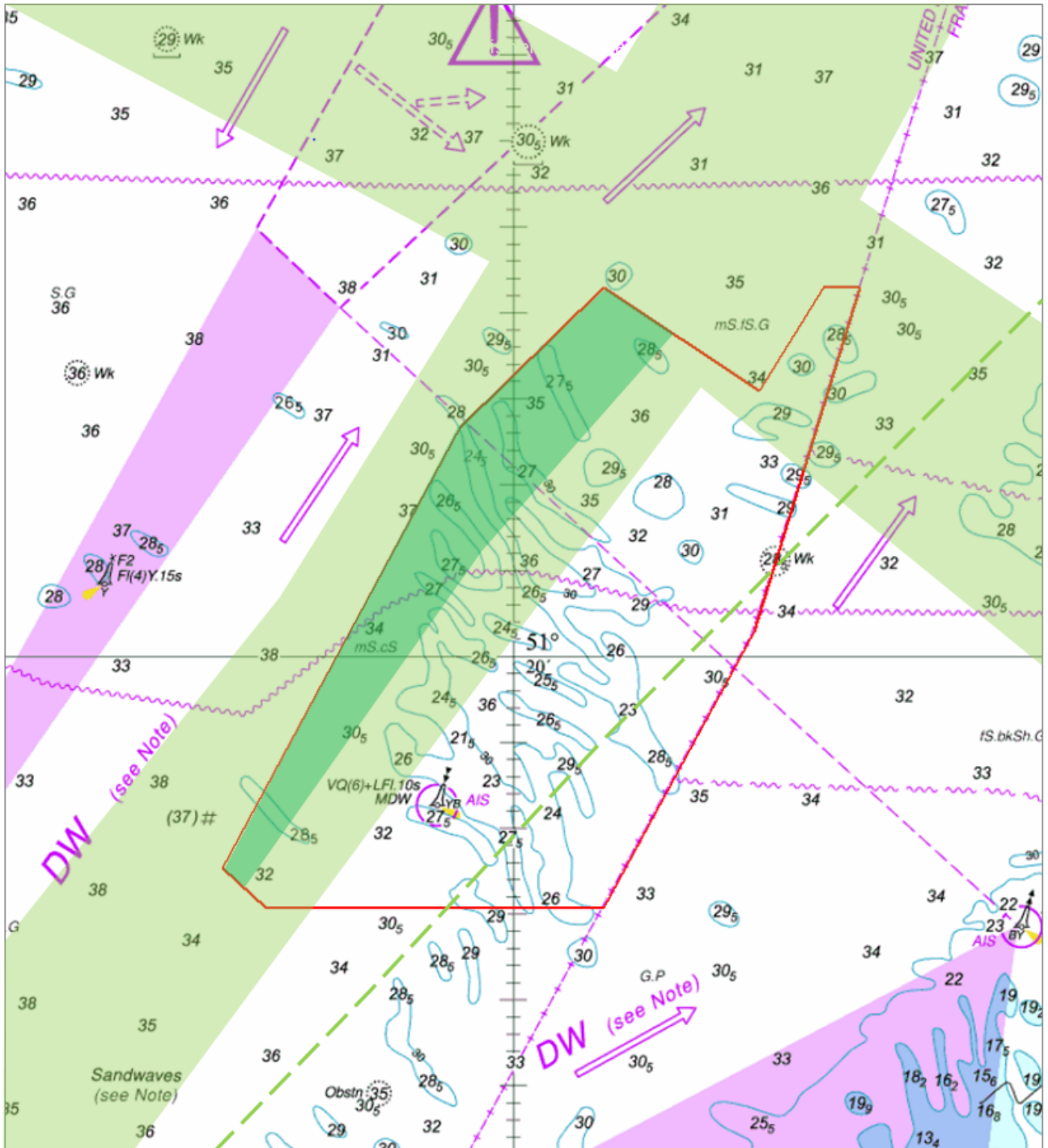
C

Profile C-D

D

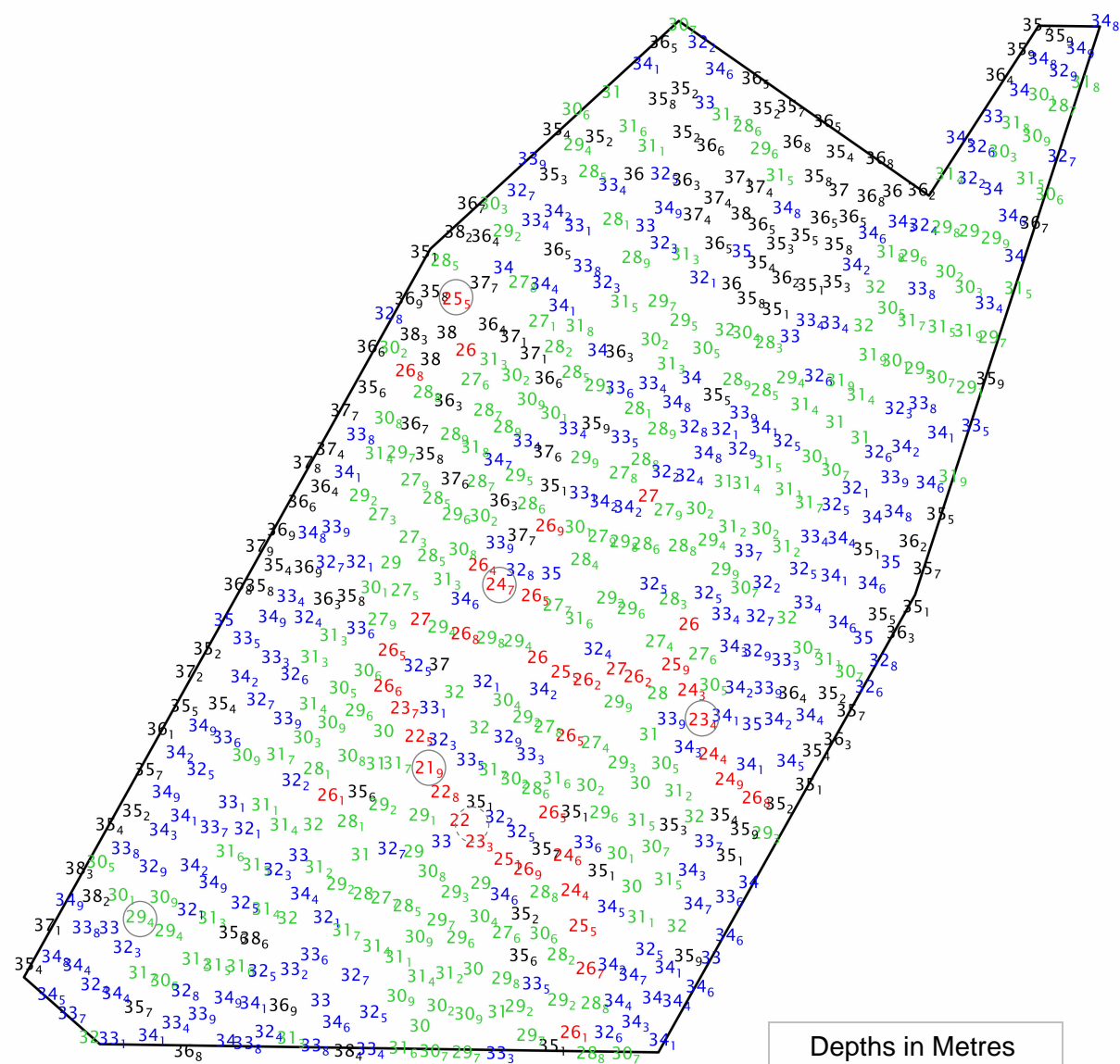
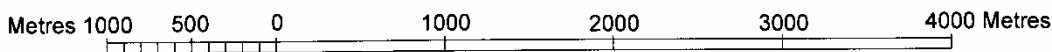


SHIPPING ROUTES



- Main shipping route based on sample AIS data
- Indicative route of lower density shipping
- Region of DWR B2 used by ships drawing 18.0 metres or more based on sample AIS data

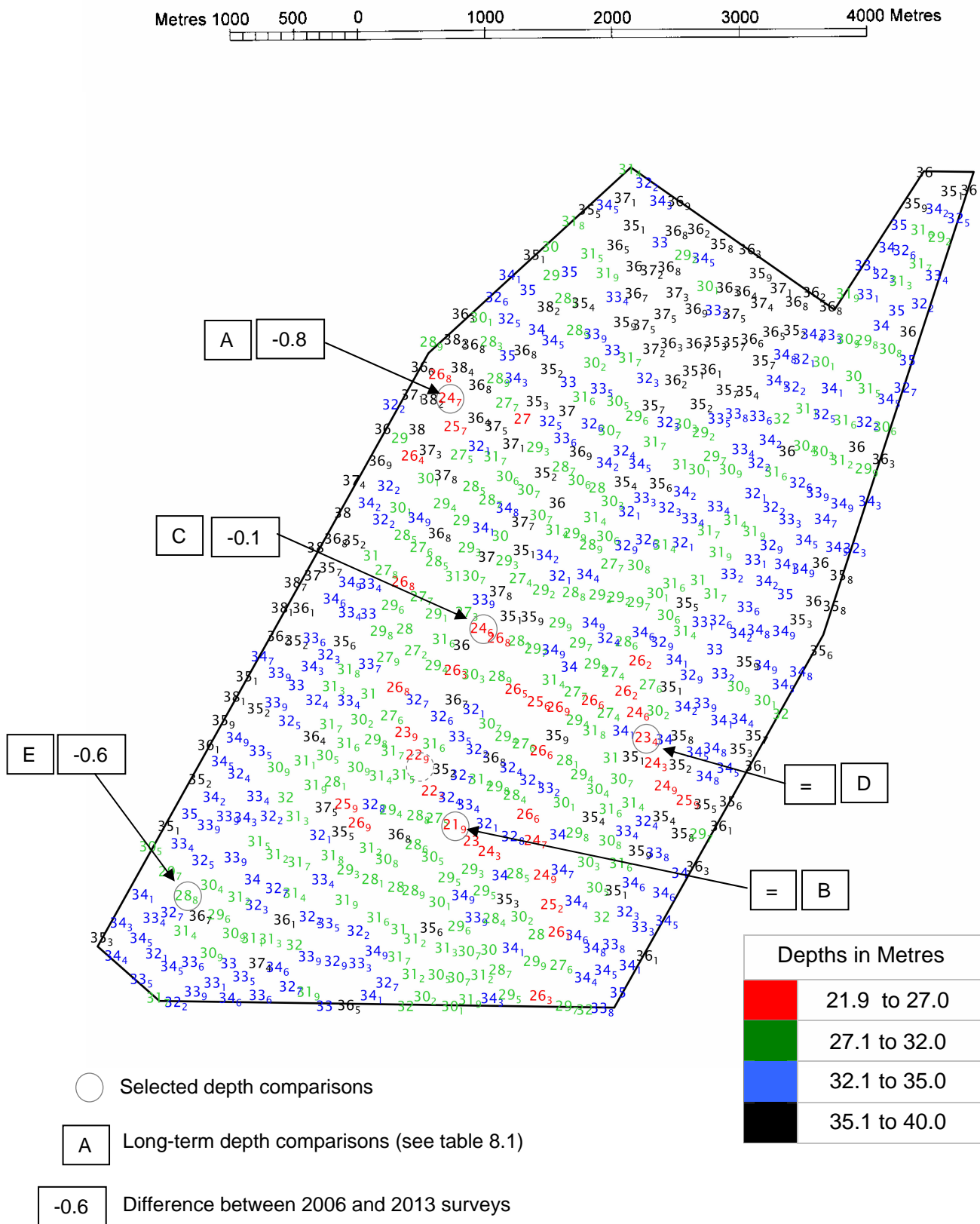
COLOUR BANDED DEPTH PLOT
 FROM THE 2006 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:45,000



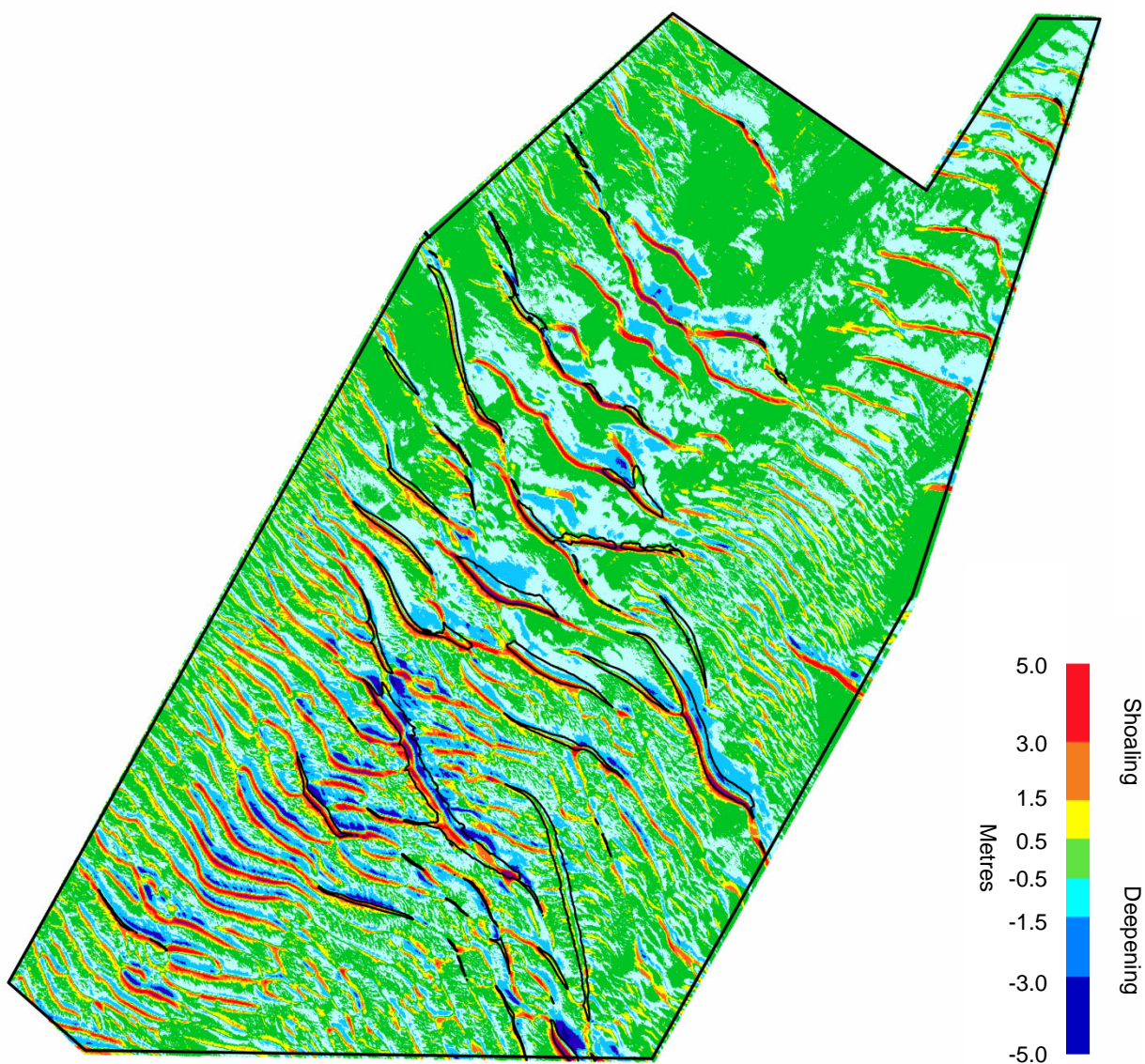
○ Selected depth comparisons

Depths in Metres	
	21.9 to 27.0
	27.1 to 32.0
	32.1 to 35.0
	35.1 to 40.0

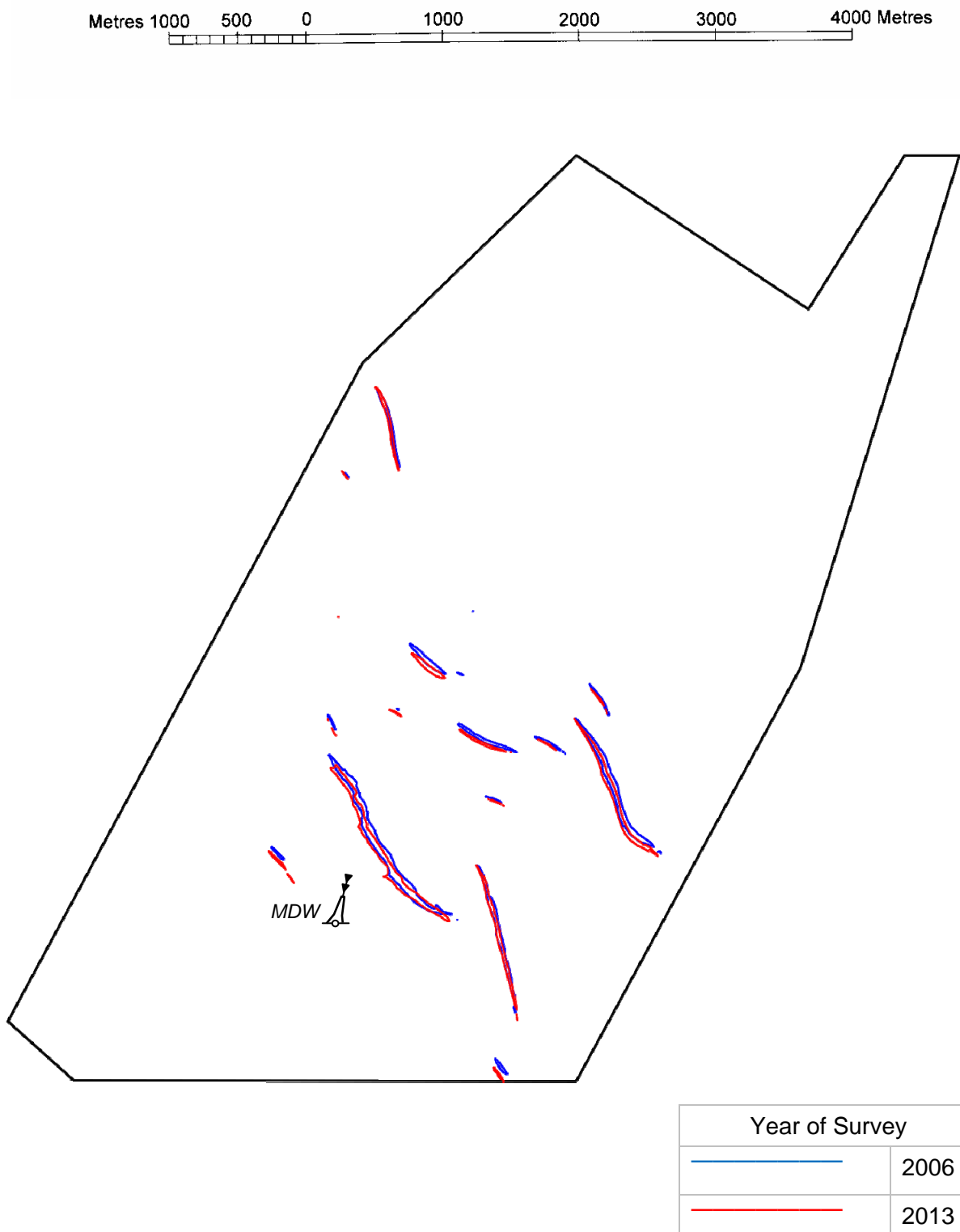
COLOUR BANDED DEPTH PLOT
 FROM THE 2013 SURVEY
 SHOWING SELECTED DEPTHS
 SCALE 1:45,000



VARIABILITY PLOT SHOWING
BATHYMETRIC CHANGES BETWEEN THE 2006 AND 2013 SURVEYS
AND CHARTED CONTOURS FROM THE 2013 SURVEY

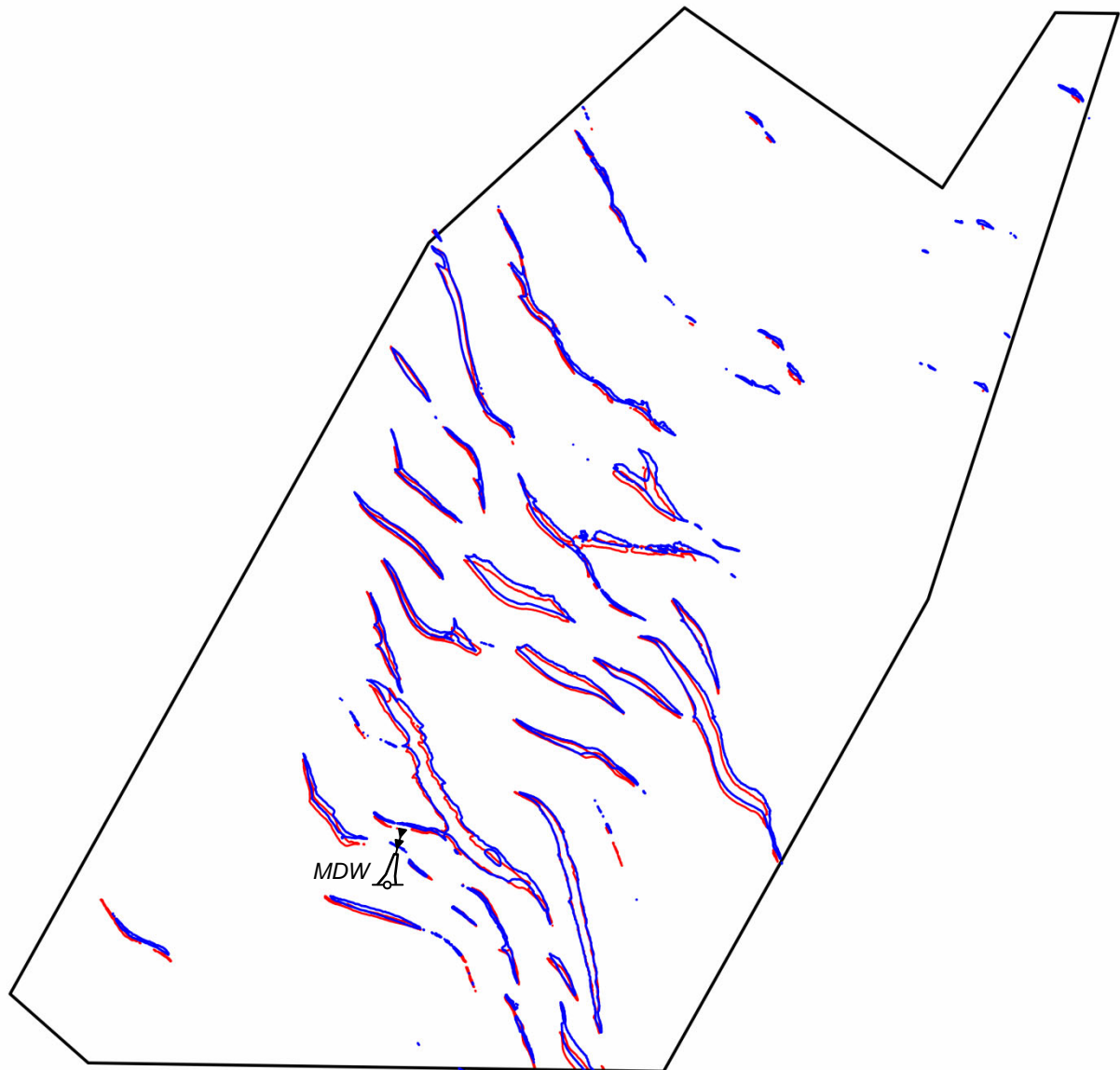
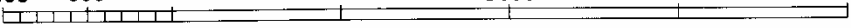




COMPOSITE DIAGRAM OF THE
27 METRE CONTOUR FROM THE 2006 AND 2013 SURVEYS
SCALE 1:45,000



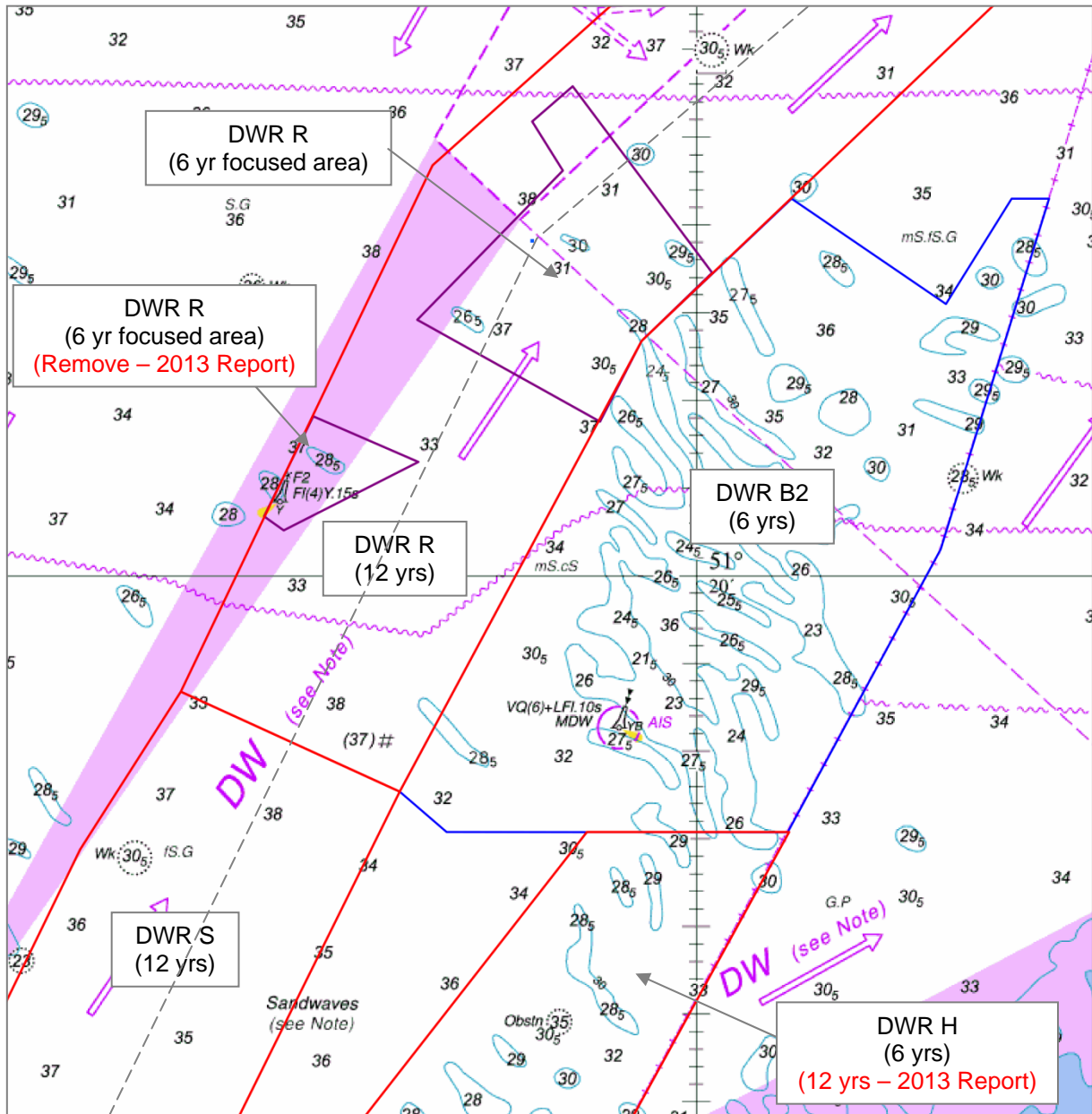
COMPOSITE DIAGRAM OF THE
30 METRE CONTOUR FROM THE 2006 AND 2013 SURVEYS
SCALE 1:45,000

Metres 1000 500 0 1000 2000 3000 4000 Metres



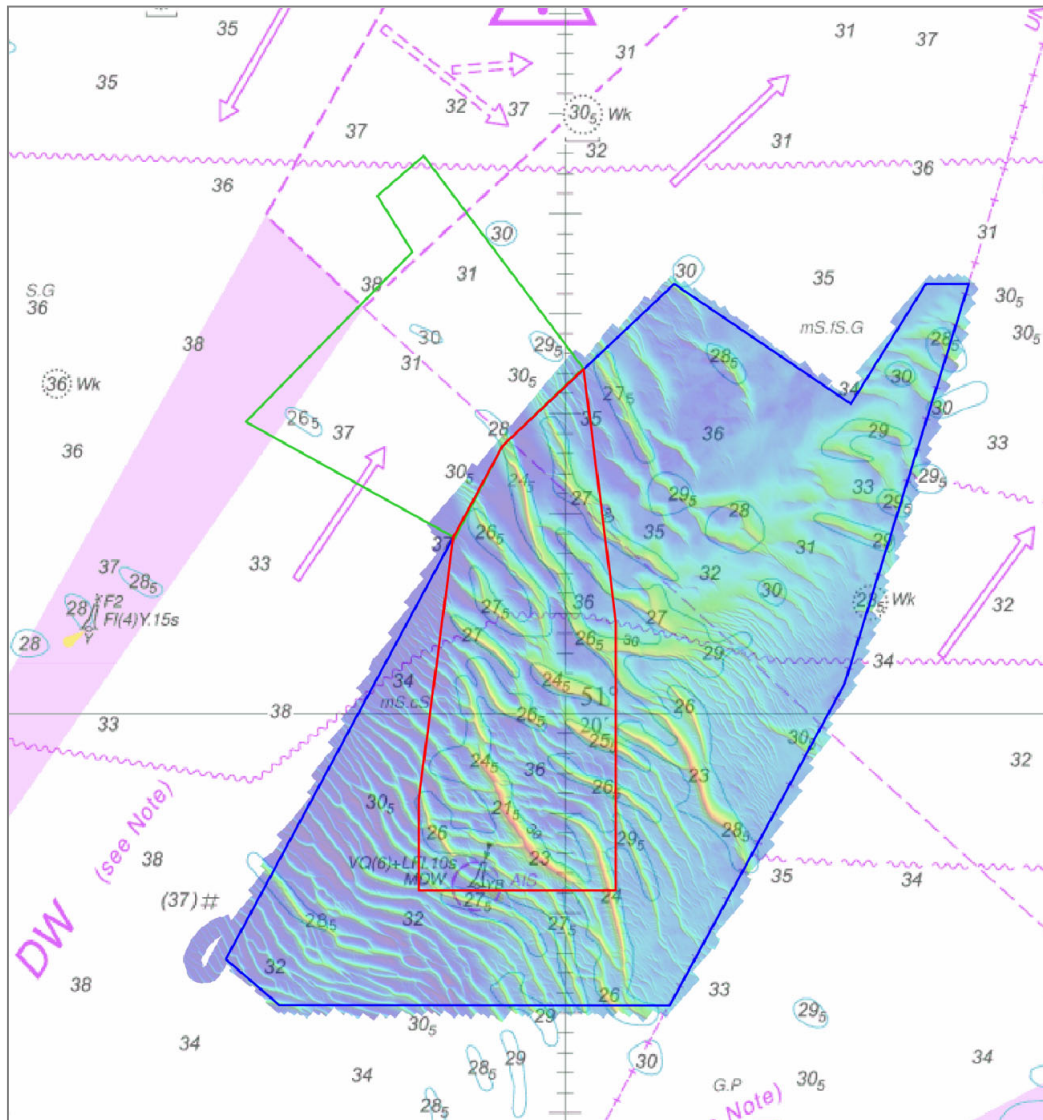
Year of Survey	
	2006
	2013

ADJACENT SURVEY AREAS



Red text = proposed changes in adjacent areas
 ----- Recommended Deep Draught Track

PROPOSED FOCUSED SURVEY AREA



Existing Area (extend from 6 to 12 Yr)	———
Proposed 6 Yr Focused Area	———
Existing 6 Yr Focused Area DWR R	———