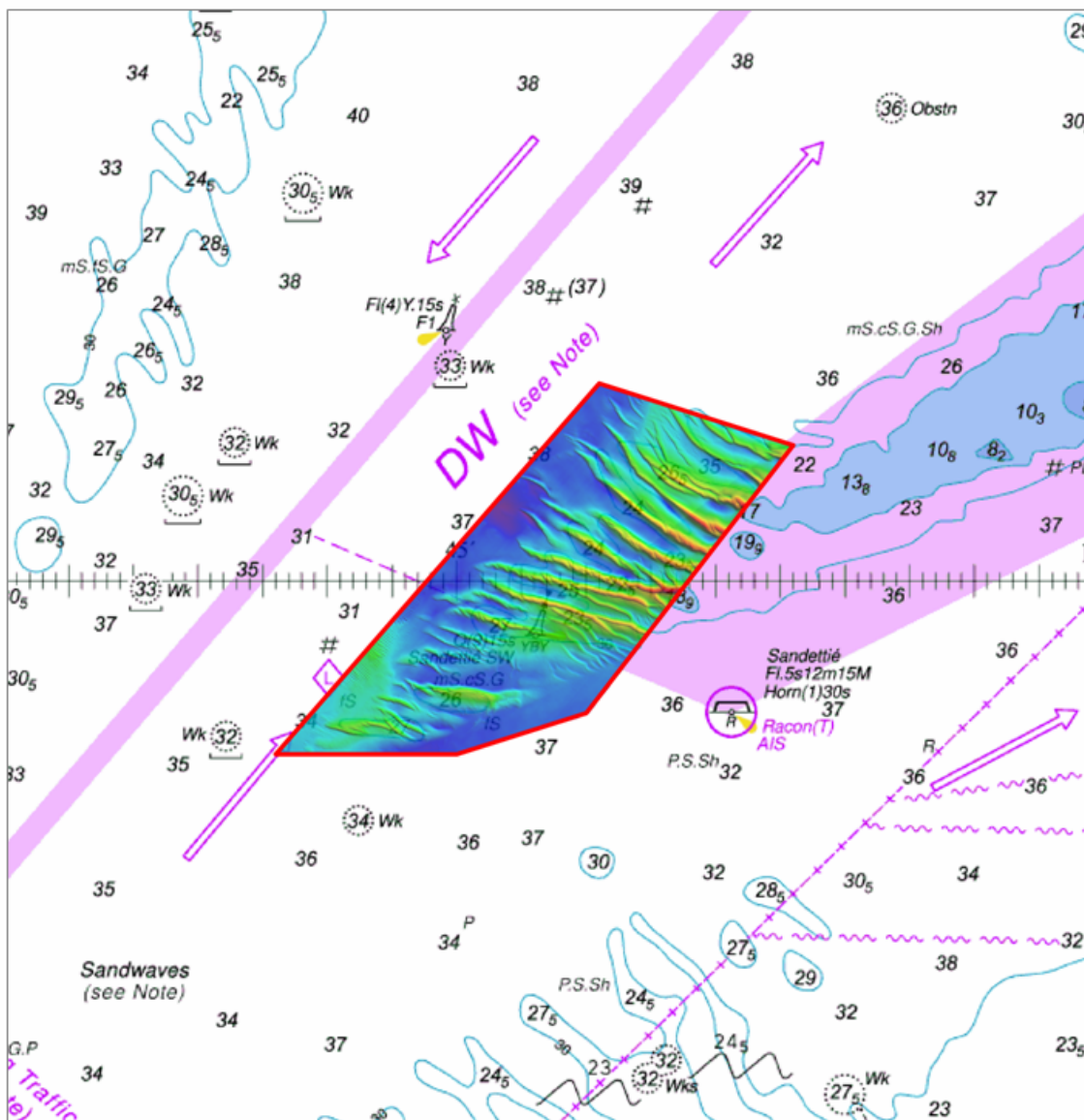




## DOVER STRAIT

### SOUTH WEST SANDETTIE

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



# DOVER STRAIT

## SOUTH WEST SANDETTIE

### Assessment DWR A/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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## **SOUTH WEST SANDETTIE, 2013**

### **1 EXECUTIVE SUMMARY**

- 1.1 Area DWR A is currently surveyed on a 6-year cycle under the Civil Hydrography Programme.
- 1.2 It covers the south-west limit of Sandettié Bank and part of the Sandettié Deep Water Route (DWR), which forms part of the north-east bound lane of the Dover Strait Traffic Separation Scheme (TSS).
- 1.3 Minimum depths over sandwaves are generally deeper than in the 2006 survey, with the minimum depth in the south of the area increasing from 27.0 to 29.1 metres, where a single large sandwave has been replaced with two smaller sandwaves.

#### **Reasons for Continuing to Resurvey the Area**

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

#### **Recommendations**

- 1.5 Considering the draught of vessels using the area and variability of bedforms in the south-west of the area, it is recommended that the 6-year survey interval is retained.
- 1.6 The eastern side contains the shallowest depths in the area, to 19.4 metres, but considering the small number of vessels observed using this area, drawing up to 5.2 metres, it is recommended the limits are revised to remove this area.

### **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 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 are conducted. The area covers part of a Deep Draught Route (DDR) for vessels drawing 20.7 to 22.6 metres and was to be resurveyed annually. The south-western end of Sandettié Bank was resurveyed prior to the establishment of DWR A and a report examining five annual surveys was produced in 1975.

- 3.2 Following recommendations made in a 1994 report on the area, the survey interval was extended to 3 years and further extended to 6 years after the report on the 2003 survey.
- 3.3 Details of the area, including survey history are at [Annex A](#).

#### **4 DESCRIPTION OF THE AREA**

- 4.1 DWR A covers the south-west limit of Sandettié Bank and part of the Sandettié Deep Water Route (DWR), which forms part of the north-east bound lane of the Dover Strait Traffic Separation Scheme (TSS).
- 4.2 It covers part of a recommended Deep Draught Route (DDR) for vessels drawing 20.7 to 22.6 metres. The route consists of a series of waypoints and a 1 Nautical Mile safety corridor. The United Kingdom Department for Transport recommends an Under Keel Allowance (UKA) for deep draught vessels using this part of the route of 5.1 metres, as detailed in the Admiralty Sailing Directions (NP 28). Assuming a maximum draught of 22.6 metres for vessels bound for Europoort this gives a critical depth for DWR A of 27.7 metres.
- 4.3 The Netherlands Deep Draught Planning Guide (HP 8) contains details on passage from Greenwich Buoy to Europoort for vessels with a draught of between 20.7 metres and 22.6 metres. This publication includes details on the effects upon draught due to squat, rolling and pitching for different ship speeds and ship dimensions. It states that UKA values, including allowance for changes in seabed, surges and inaccuracies of soundings are such that a deep draught vessel should be able to proceed along the route under almost all conditions of tide, swell or sea state, except between waypoints L and M (Noord Hinder Junction), where depths may be insufficient because of extreme vessel motion due to very heavy swell or high sea state.
- 4.4 The area is dominated by large symmetrical and asymmetrical sandwaves up to 15 metres in height lying across the south-west limit of Sandettié Bank, the net sediment transport, based on sandwave asymmetry, is in opposing directions across the area as shown at Annex B. More general underlying ridges lie across the area, as show at [Annex C](#). The area comprises an area of 2.06 sq NM (7.06 sq km).

#### **5 SHIPPING IN THE AREA**

- 5.1 Sample AIS data shows that a large number of vessels using the Deep Water Route pass along the western side of DWR A, as depicted at [Annex D](#). These vessels are shown drawing up to 20.5 metres along the far western side of the area, with vessels drawing up to 17.8 metres passing closer to Sandettié SW buoy.
- 5.2 Vessels following a recommended track for vessels drawing 20.7 to 22.6 metres pass close by or through the far southwest of the area, within the routes 1 Nautical Mile safety corridor, drawing up to a reported 22.8 metres. The indicative route of these very deep draught vessels is shown at [Annex D](#); vessels generally adopt a straighter track than the recommended route, passing to the east of the recommended waypoint.
- 5.3 The main lane for north-east bound traffic lies to the south-east of Sandettié Bank and should be followed by all vessels whose draught is less than 16 metres and allows them to use it safely. Traffic adopting this route passes well to the south-east of DWR A, as shown at [Annex D](#), although some drawing less than 16 metres choose to use the Deep Water Route.

## 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 assessed accuracy of depth measurements met IHO S-44 (4<sup>th</sup> Edition) Order 1.

## 7 2013 SURVEY DETAILS

- 7.1 The survey was conducted from 27 to 29 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 (5<sup>th</sup> Edition) Order 1a standard.
- 7.3 In both surveys, full seafloor cover with multibeam was achieved. A 3D View of the 2013 survey is at [Annex C](#), showing the south-west limit of Sandettié Bank and overlying sandwaves.

## 8 DESCRIPTION OF RECENT BATHYMETRIC CHANGE

- 8.1 Colour banded depth plots of the 2006 and 2013 surveys are at [Annexes E](#) and [F](#) respectively and allow a comparison of depth values.
- 8.2 A variability plot, at [Annex G](#), shows the changes in depth between the 2006 and 2013 surveys.
- 8.3 Comparison plots of the 25 and 30 metre contours are at [Annexes H](#) and [I](#) respectively.
- 8.4 Cross-sections at [Annex B](#) show the mobility in the area, with sandwaves migrating by up to 70 metres since the 2006 survey.
- 8.5 Minimum depths over selected sandwaves examined are generally deeper than in the 2006 survey, as shown at [Annex F](#). In the south of the area a single sandwave has been replaced by two smaller sandwaves, with the minimum depth in the area increasing from 27.0 metres to 29.1 metres. The profile over these sandwaves is shown in figure 8.1.

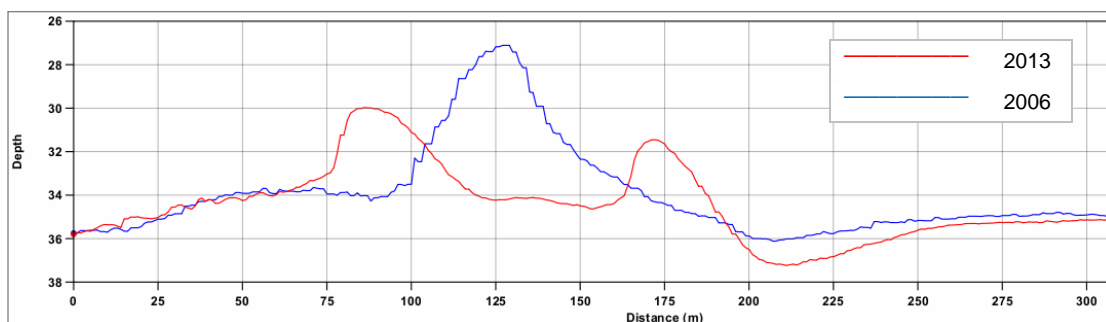


Figure 8.1: Change to sandwave in south of area

- 8.6 The minimum depth in the 2013 survey is 19.4 metres on the eastern edge of the area.
- 8.7 Long-term variability has been examined in surveys from 1993 onwards for two areas, as shown in table 8.1 and figure 8.2, the location of these areas are shown at [Annex F](#).

Year	Area A	Area B
1993	27.5	27.3
1994	29.0	28.5
1997	28.5	28.1
2000	28.7	27.7
2003	27.2	27.5
2006	27.0	26.0
2013	29.1	28.1
Range	2.1	2.5

Table 8.1: minimum depths found in selected areas shown at Annex F

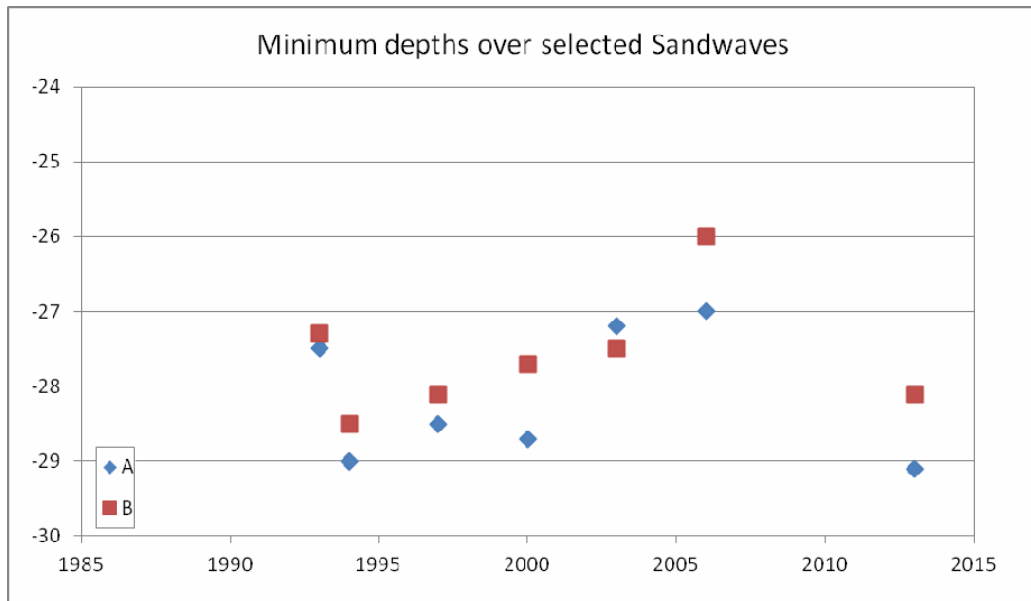


Figure 8.2: minimum depths found in selected areas shown at Annex F

- 8.8 A 2003 report contains details of minimum depths in area 'A' from 1971 to 2003; this shows charted depths rounded down to half metres ranged from 27 to 29<sub>5</sub> over that period.

## **9 IMPLICATIONS FOR SHIPPING**

- 9.1 Depths over significant sandwaves are deeper than in the 2006 survey, but highlight the variability of sandwave heights over time.

## **10 RECOMMENDATIONS FOR FUTURE SURVEYS**

- 10.1 Considering the draught of vessels using the area and variability of bedforms in the south-west of the area, it is recommended that the 6-year interval is retained.
- 10.2 The eastern side contains the shallowest depths in the area, to 19.4 metres, but considering the small number of vessels observed using this area, drawing up to 5.2 metres, it is recommended the limits are revised to remove this area as shown in Annex J, reducing the area by 15%.



AREA SPECIFICATIONS  
(Including Survey History)

**REGION:** Deep Water Route**NAME:** SW Sandettie**AREA:** DWR A**LIMITS:**

A	51.18250°N	1.76833°E
B	51.17750°N	1.79333°E
C	51.15583°N	1.76667°E
D	51.15250°N	1.75000°E
E	51.15250°N	1.72667°E

Area co-ordinates are referred to WGS84 Datum

**AREA SIZE:** 2.06 Sq NM (7.06 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
1975	K7202			1990	M1608	HH090/490/01	s.d.
1976	K7481			1991	M1778	HH090/517/01	s.d.
1977	K7913			1992	M1926	HH090/552/01	s.d.
1978	K7969			1993	M2148	HH090/576/01	s.d.
1981	K8495	HH2820/71		1994	M2288	HH090/631/01	s.t.d
1984	K9391	HH2889/83	s.t	1997	M2840	HH090/744/01	s.d.
1985	K9714	HH2345/84	s	2000	M3414	HH090/888/01	s.d.
1986	K9868	HH2345/84	s	2003	M3929	HH091/026/01	s.t.d
1987	M1120	HH4028/86	s.t	2006/7	HI1159	2007-2068	m
1988	M1239	HH6345/87	s.t.d	2013	HI1434	2013-269142	m
1989	M1344	HH090/460/01	s.t.d				

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

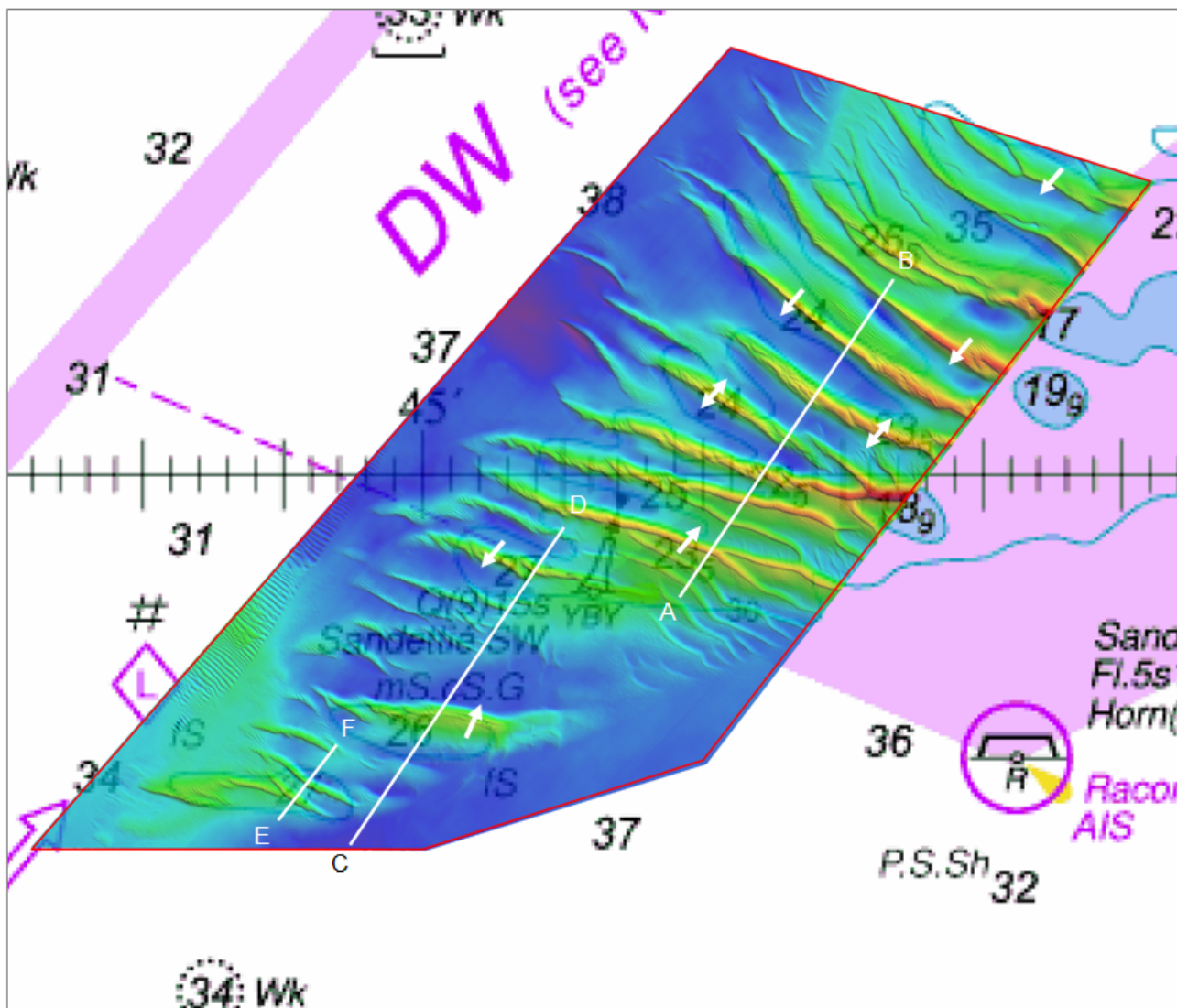
**REPORTS:** 1975 Five surveys examined  
 1985 Latest survey included K9391 (H0423/85)  
 1994 Latest survey included M2288 (HA145/02/03/04-E20)

**ASSESSMENTS:** 1997 M2840 (HA145/010/010/01)  
 2000 M3414 (HA145/010/010/01 E7)  
 2003 M3929

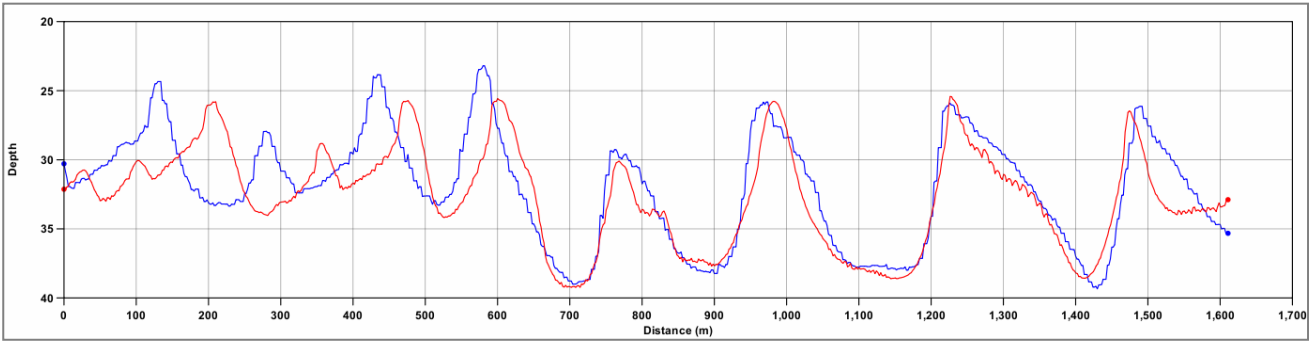
**REMARKS:** 1984 Area A established (HH6026/82 E53)  
 1994 Report reduces survey interval to 3 years (HA145/02/03/04-E20).  
 1995 Area partially surveyed by the Dutch M2470/6  
 2003 Report reduces survey interval to 6 years

**LARGEST SCALE CHART:** BA 323

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



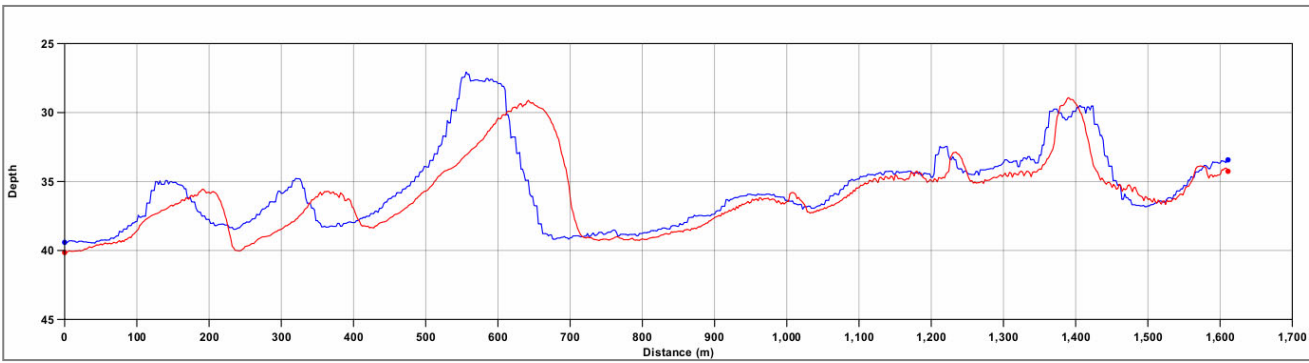
→ Sediment transport based on sandwave asymmetry



A

Profile A-B

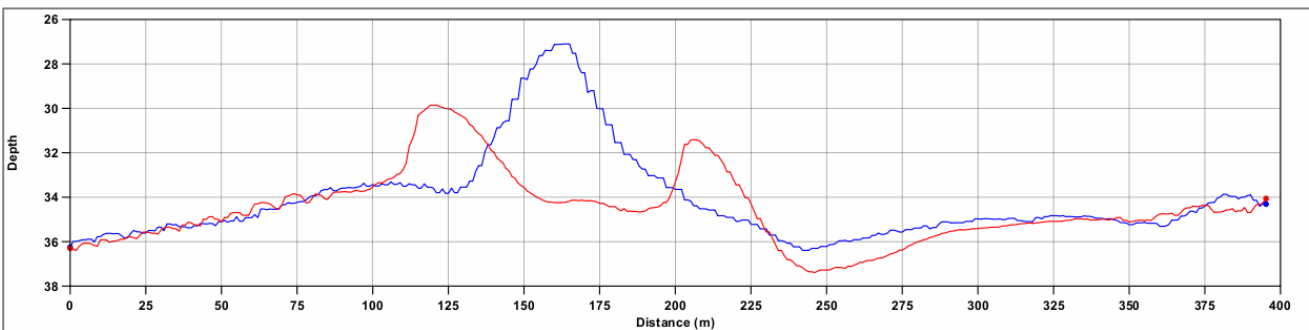
B



C

Profile C-D

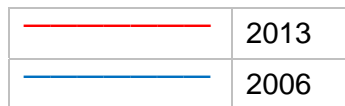
D



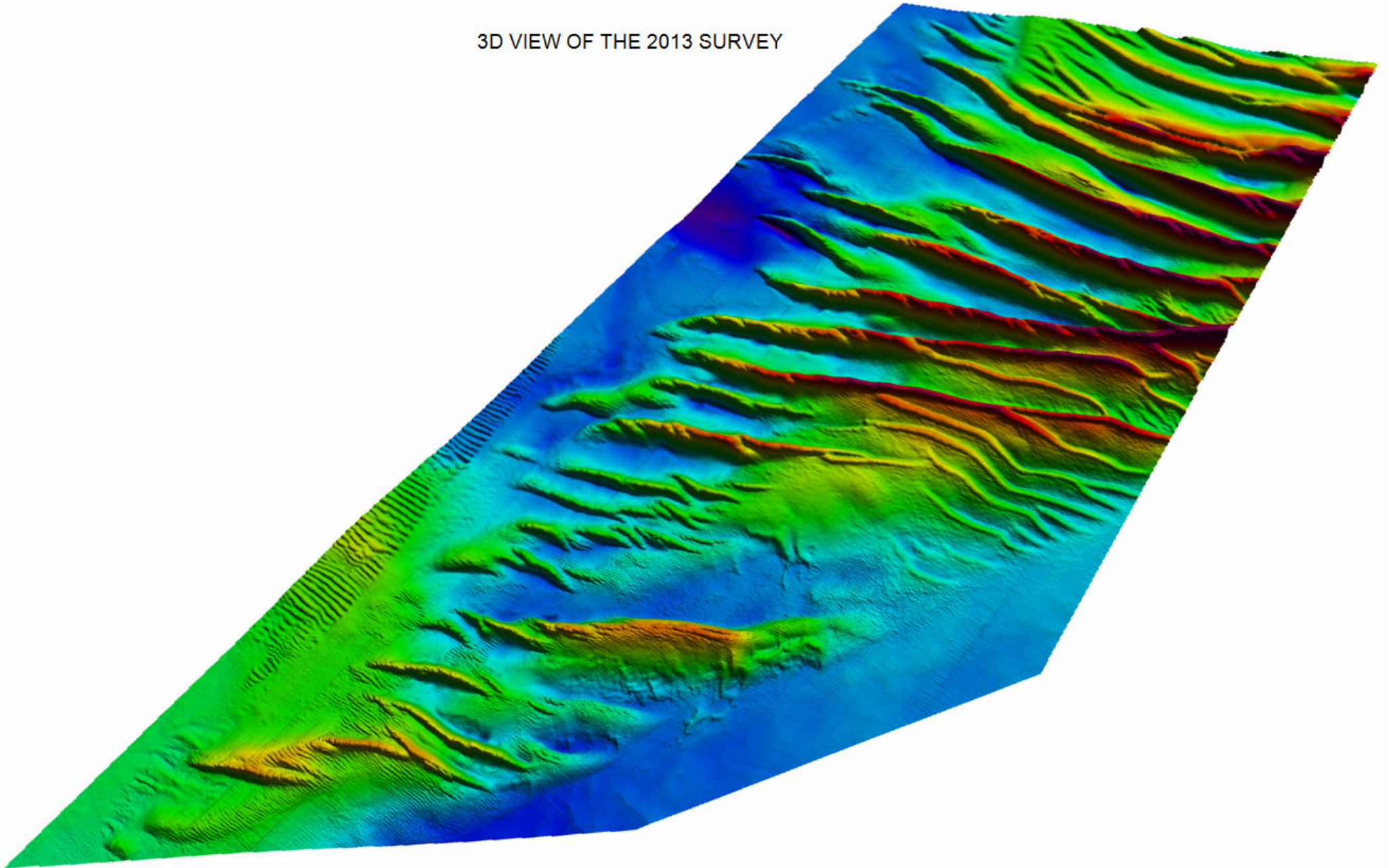
E

Profile E-F

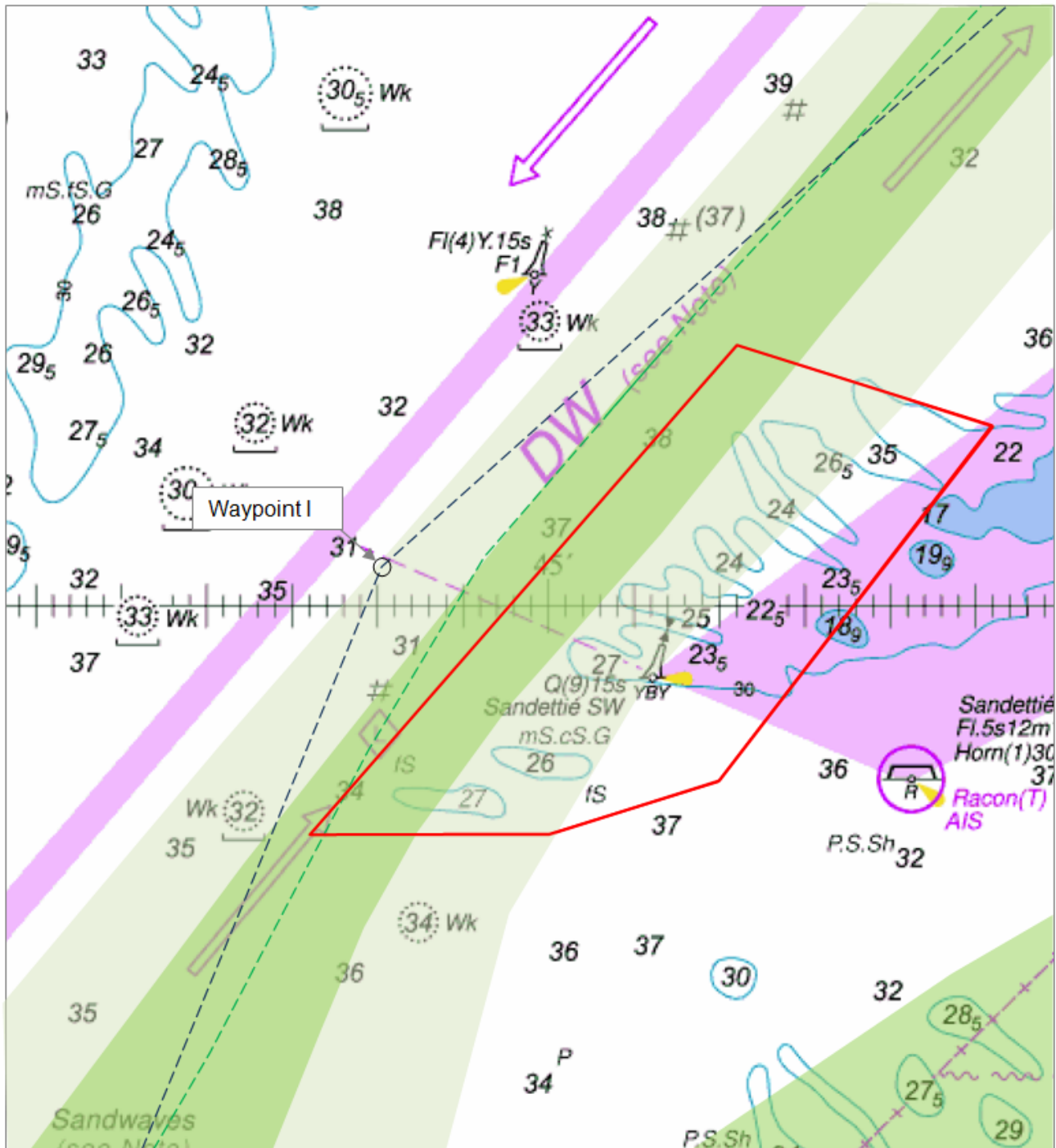
F



3D VIEW OF THE 2013 SURVEY

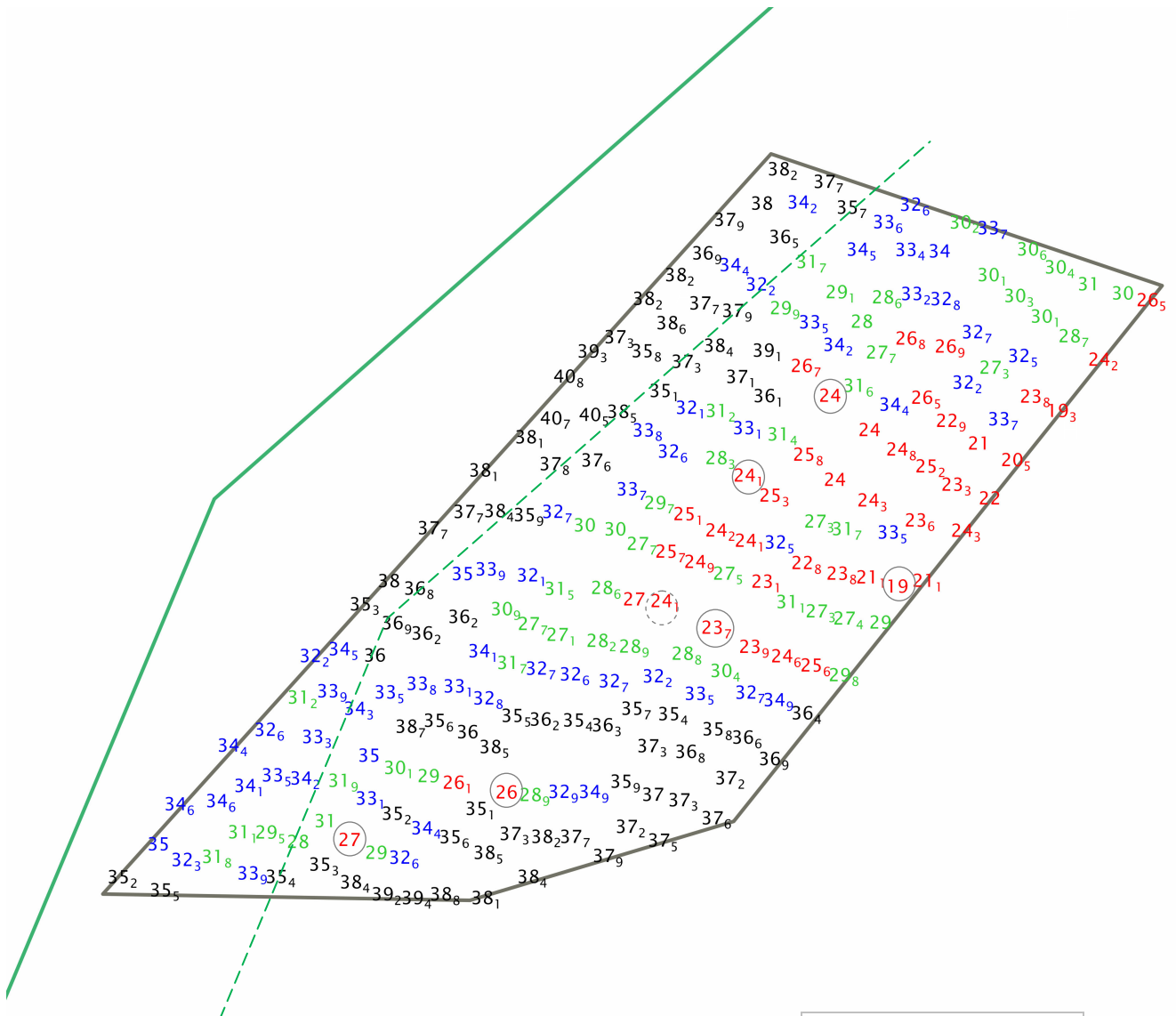
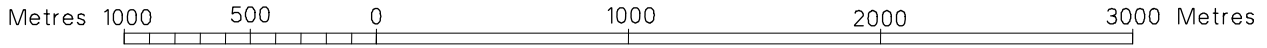


SHIPPING ROUTES



- Dense shipping route based on sample AIS data
- Lower density shipping route based on sample AIS data
- Indicative route of deep draught shipping (>20m)
- Recommended Deep Water Route for vessels drawing 20.7 – 22.6 metres

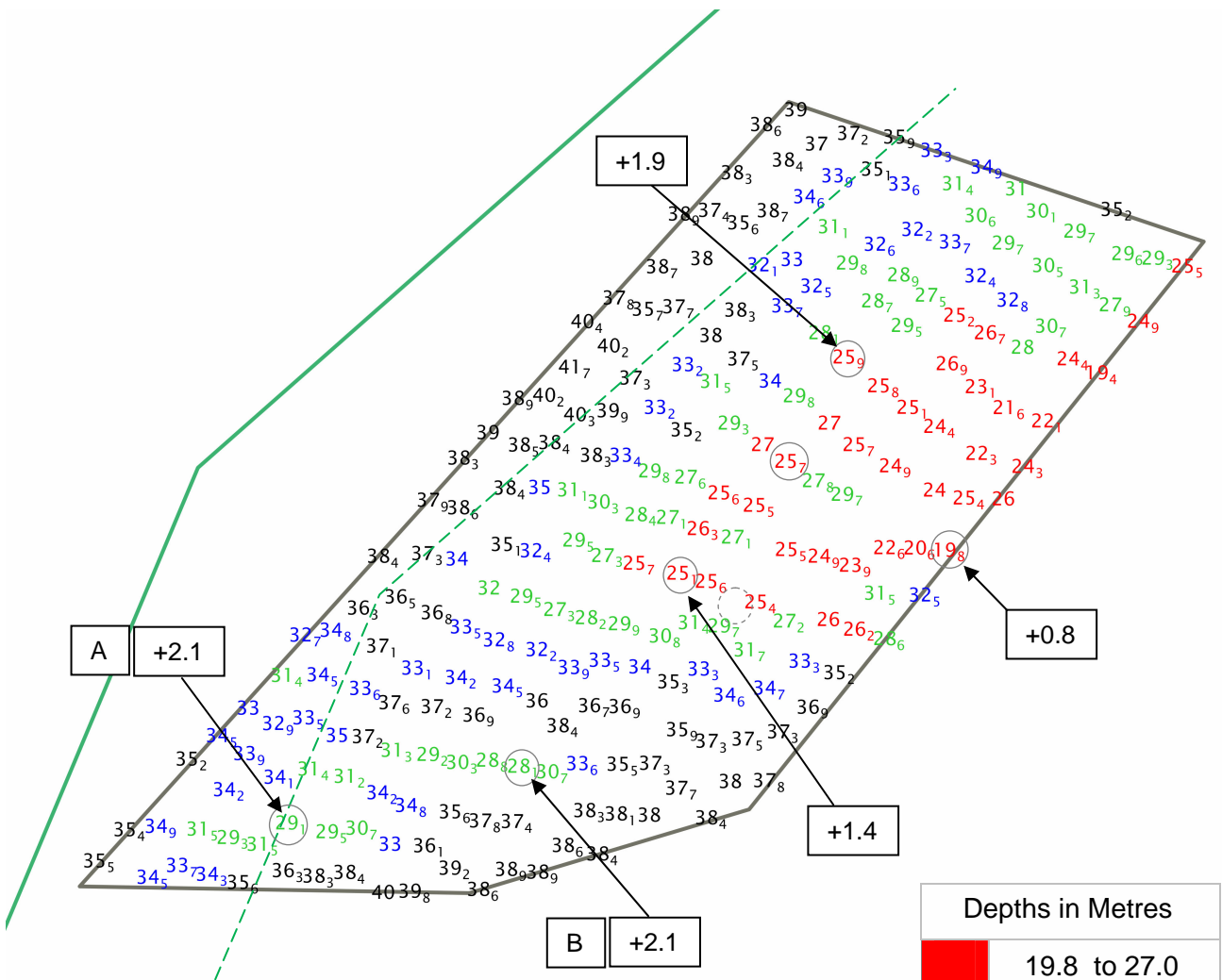
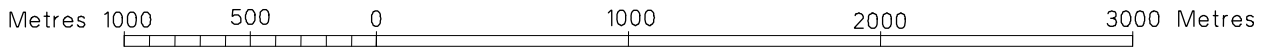
COLOUR BANDED DEPTH PLOT  
 FROM THE 2006 SURVEY  
 SHOWING SELECTED DEPTHS  
 SCALE 1:30,000



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

- Selected depth comparisons
- Recommended Deep Draught Track
- - - Eastern limit of 1 NM safety corridor

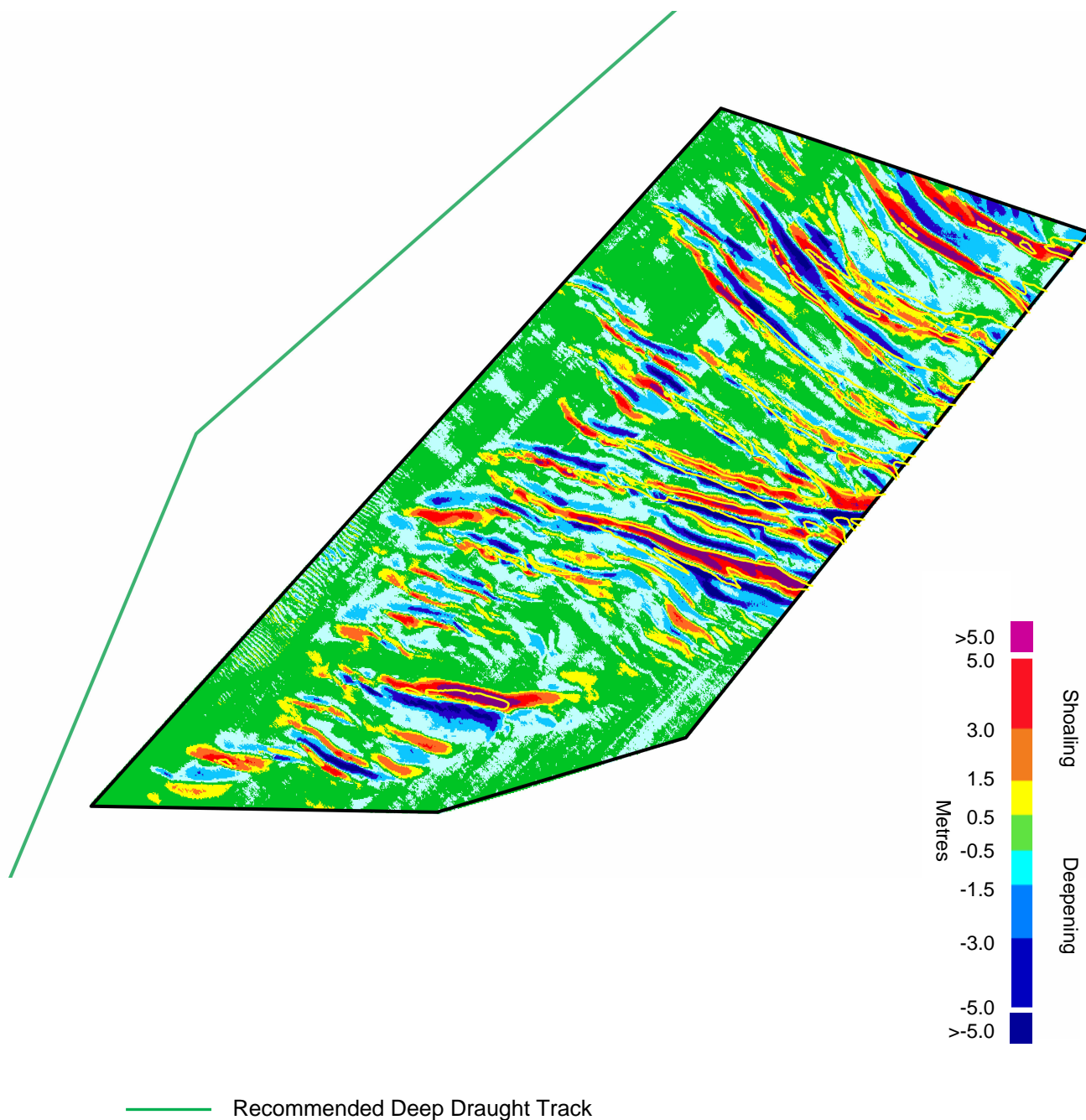
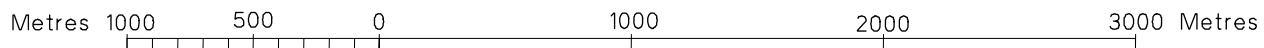
COLOUR BANDED DEPTH PLOT  
 FROM THE 2013 SURVEY  
 SHOWING SELECTED DEPTHS  
 SCALE 1:30,000



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

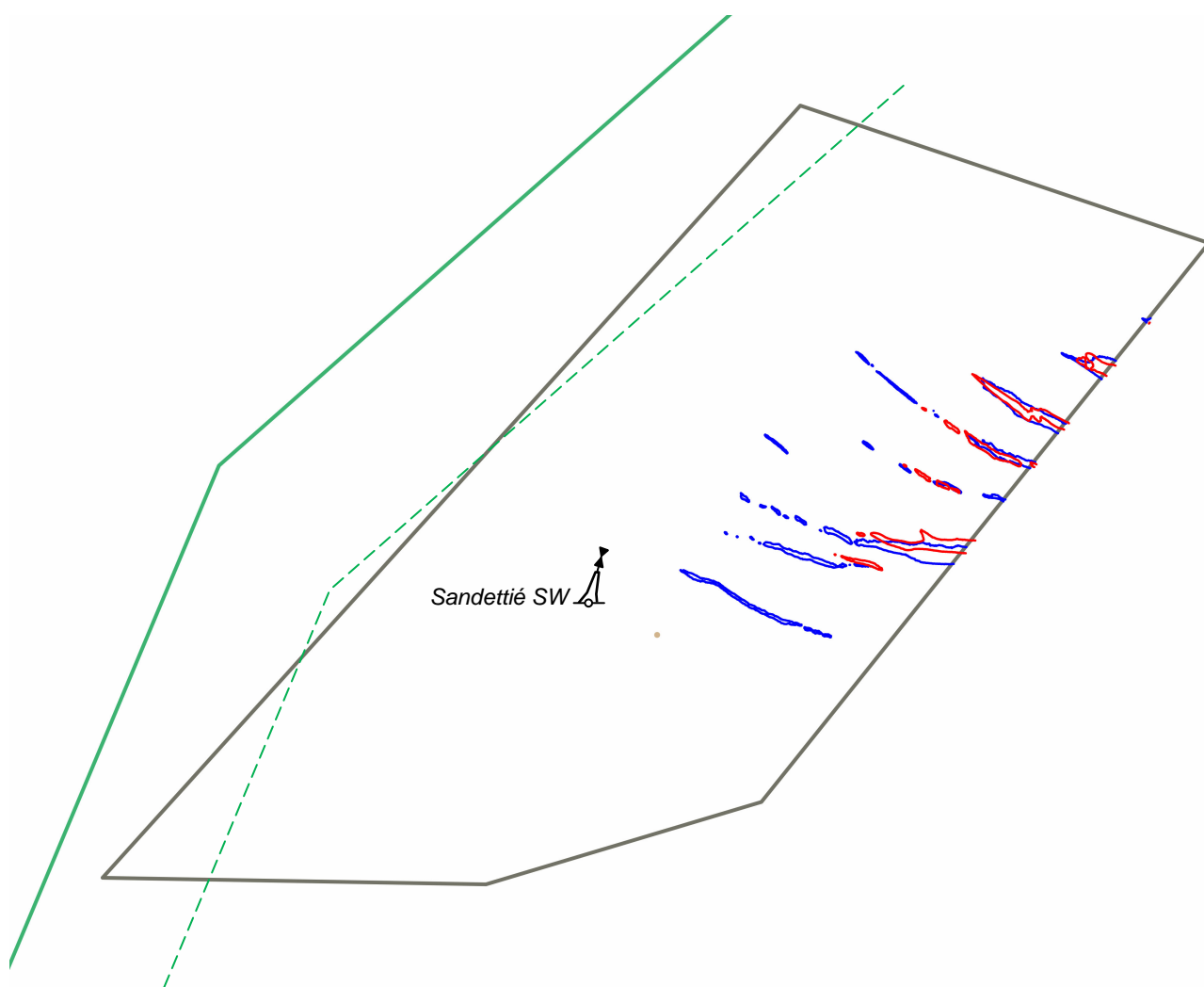
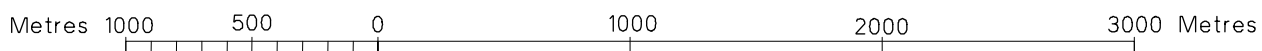
- Selected depth comparisons
- Recommended Deep Draught Track
- Eastern limit of 1 NM safety corridor
- A Long-term depth comparisons (see table 8.2)
- +0.8 Difference between 2006 and 2013 surveys



VARIABILITY PLOT SHOWING  
BATHYMETRIC CHANGES BETWEEN THE 2006 AND 2013 SURVEYS  
AND CHARTED CONTOURS FROM THE 2013 SURVEY  
SCALE 1:30,000







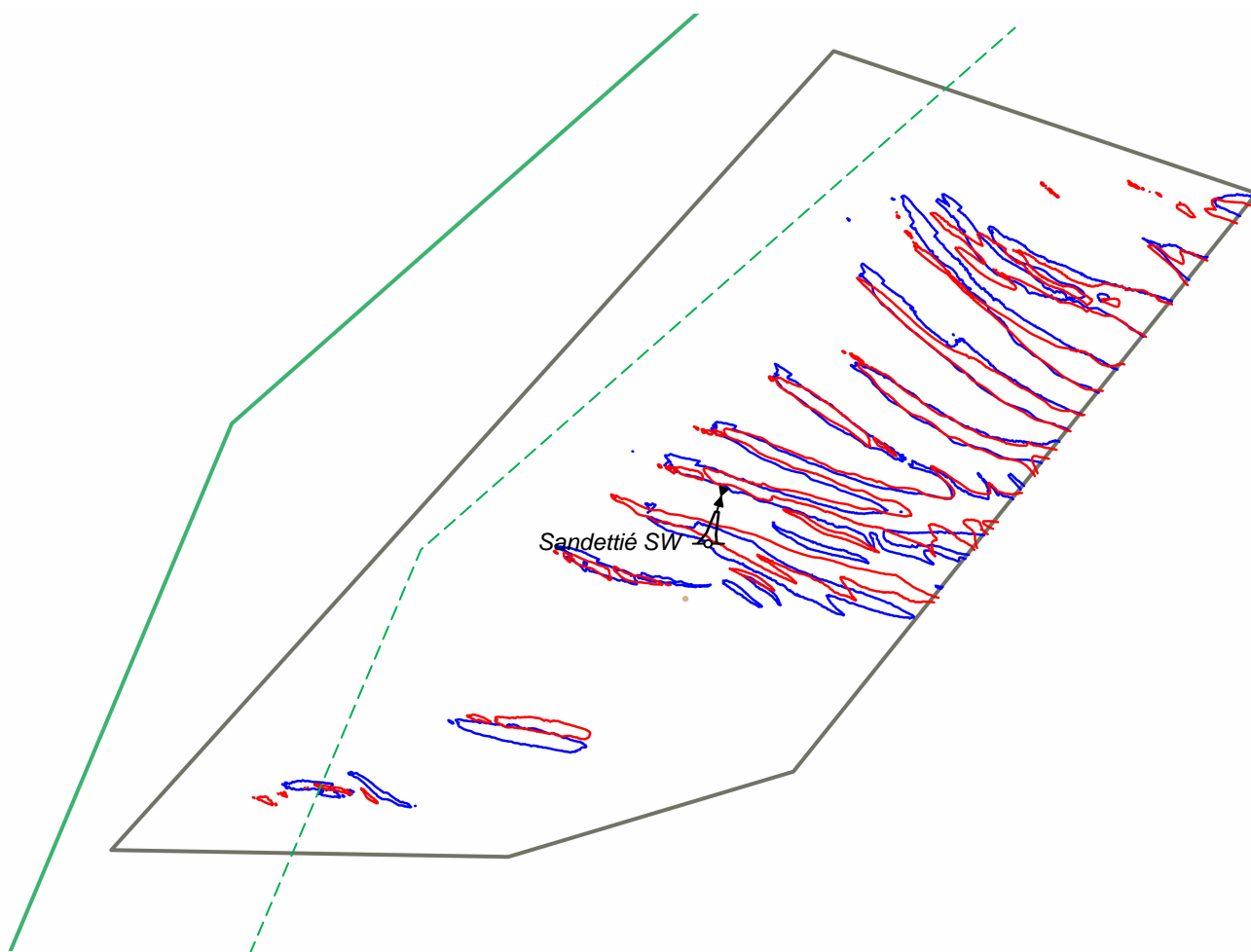
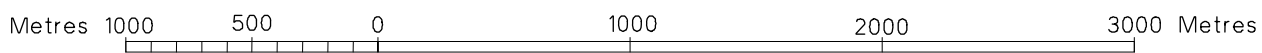
COMPOSITE DIAGRAM OF THE  
25 METRE CONTOUR FROM THE 2006 AND 2013 SURVEYS  
SCALE 1:30,000







Year of Survey	
	2013
	2006

-  Recommended Deep Draught Track
-  Eastern limit of 1 NM safety corridor

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



Year of Survey	
	2013
	2006

-  Recommended Deep Draught Track
-  Eastern limit of 1 NM safety corridor

PROPOSED REVISED LIMITS

