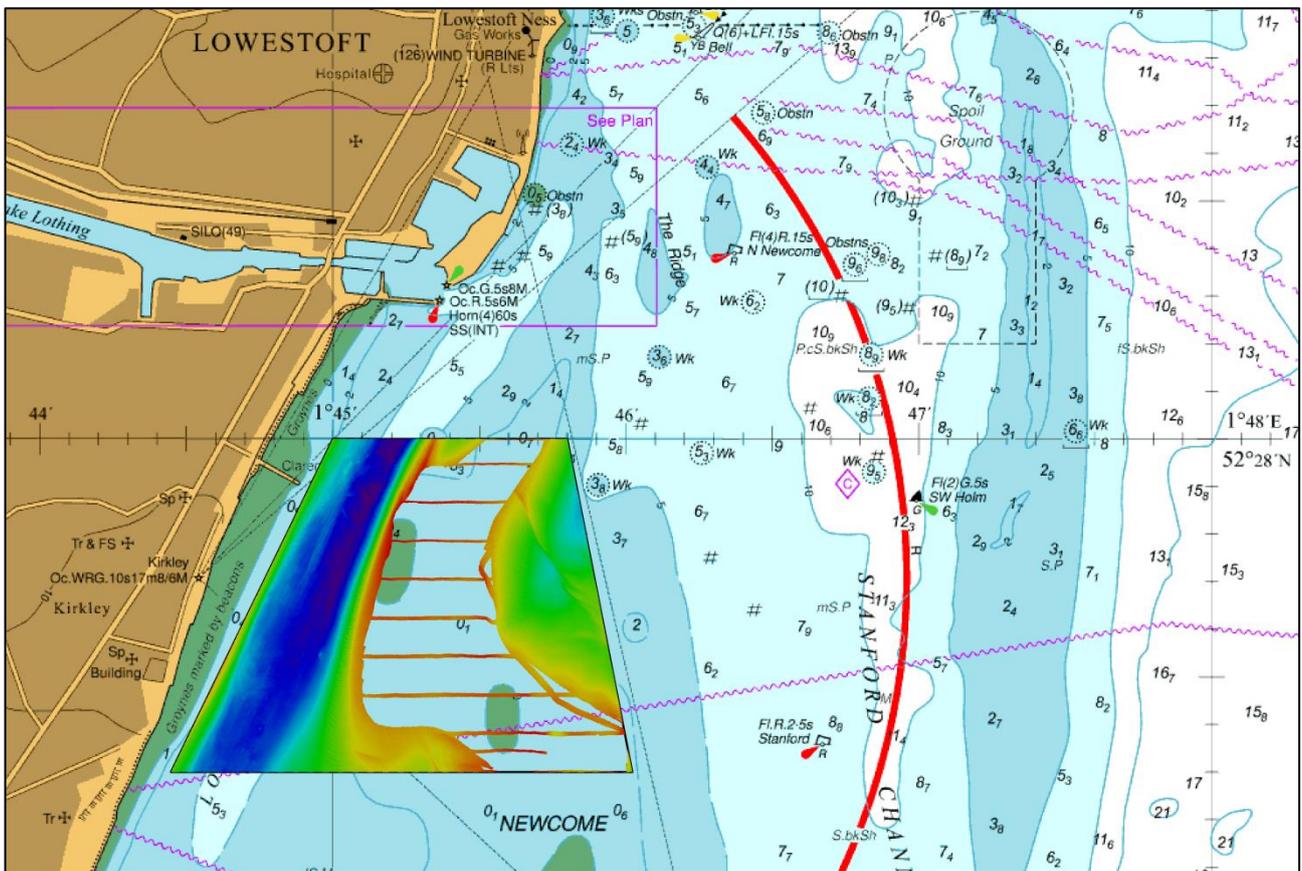




## EAST ANGLIA

### LOWESTOFT SOUTH ROAD & LOWESTOFT BANK

ASSESSMENT ON THE ANALYSIS OF ROUTINE RESURVEY AREA EA12A  
FROM THE 2015 SURVEY



ENGLAND - EAST ANGLIA  
LOWESTOFT SOUTH ROAD & LOWESTOFT BANK  
Assessment EA12A/2015

A 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

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.

This material is protected by Crown Copyright. It may be downloaded from the UK Hydrographic Office's (UKHO) web site and printed in full for personal or non-commercial internal business use. Extracts may also be reproduced for personal or non-commercial internal business use on the condition that the UK Hydrographic Office is acknowledged as the publisher and the Crown is acknowledged as the copyright owner.

Applications for permission to reproduce the material for any other purpose (including any distribution of the material or extracts to third parties) can be made interactively on the UKHO's web site ([www.ukho.gov.uk](http://www.ukho.gov.uk)), by e-mail to [intellectualproperty@ukho.gov.uk](mailto:intellectualproperty@ukho.gov.uk) or in writing to Intellectual Property, UK Hydrographic Office, Admiralty Way, Taunton, Somerset, TA1 2DN.

## CONTENTS

1.	Executive Summary	1
2.	Introduction	1
3.	History	1
4.	Description Of The Area	2
5.	Shipping In The Area	2
6.	2014 Survey Details	3
7.	2015 Survey Details	2
8.	Description Of Recent Bathymetric Change	3
9.	Implications For Shipping	4
10.	Recommendations For Future Surveys	4

## ANNEXES

A.	Area Specifications	5
B.	Shipping Routes	6
C.	Sun Illuminated View of the 2015 Survey Data overlaid on Chart BA1535	7
D.	Cross Sections from the 2014 and 2015 Survey	8
E.	Colour Banded Depth Plot from the 2014 Survey Showing Selected Depths	9
F.	Colour Banded Depth Plot from the 2015 Survey Showing Selected Depths	10
G.	Variability Plot Showing Bathymetric Changes between the 2014 and 2015 Survey Data	11
H.	Composite Diagram of the 3 metre Contour from the 2014 and 2015 Surveys	12
I.	Composite Diagram of the 6 metre Contour from the 2014 and 2015 Surveys	13

## **LOWESTOFT ROAD SOUTH & LOWESTOFT BANK, EA12, 2015**

### **1. EXECUTIVE SUMMARY**

#### **The Area and Recent Changes**

- 1.1 Following the 2014 ten year survey of the area EA12, it was recommended that a focused inshore area south of Lowestoft incorporating Lowestoft South Road and Lowestoft Bank should be resurveyed in 2015 (EA12A). The results of this survey would inform the frequency of future surveys.
- 1.2 Lowestoft South Road in the western part of EA12A is a narrow, deeper area including the deepest point of the survey at 7.26 metres. Lowestoft bank, to the east of South Road is shoaler with depths of 1 to 2 metres on its western edge to 3 to 4 metres on the eastern limits of the survey area.
- 1.3 Over the 15 months between surveys, the area has undergone relatively little change. The 6-metre contour in Annex I shows an extension of Lowestoft Road South to the north and south. However the 3-metre contour in Annexe H shows no notable movement. Comparison of depths in Annexes E and F, show that whilst there are local, minor variations, there is no more general change in depth.

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

- 1.4 Whilst only minor, localised change has been observed in area EA12A between the 2014 and 2015 surveys, it forms part of an area which is subject to ongoing sediment migration. This, along with the area's proximity to Lowestoft, requires its continued inclusion in the routine resurvey programme to ensure the chart reflects the changes.

#### **Recommendations**

- 1.5 Due to seabed mobility and the lack of recent comparable data, the area should remain as part of the routine resurvey programme. An initial resurvey interval of 4 years is recommended to coincide with the adjacent EA10 resurvey schedule with the next survey scheduled in 2019. Depending on the outcome of this next survey consideration should be given to combining areas EA12A and EA10.
- 1.6 Due to the small size of the area the area should be surveyed with full seafloor coverage with wide spaced survey lines where depths shoal to less than the 2 metres over Lowestoft Bank.

### **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 Department for Transport (including the MCA) and the MOD (including the UKHO).

### **3. HISTORY**

- 3.1 EA12, incorporating EA12A, is one of the routine resurvey areas of the East Anglian Routine Resurvey Programme and covers an area of generally shoal water to the south of Lowestoft.
- 3.2 Prior to 1980 the area that includes EA12 was designated Areas A and B. These covered an area extending from Holm Sand in the north via Pakefield Road to Barnard in the south.

- 3.3 In 1980 areas A and B were reorganised with changed limits and given the identifiers C1 and C3. These had a 1 and 3 year survey interval respectively.
- 3.4 The 1994 report on C1 and C3 radically altered the limits, removing C3 from the programme, although parts of C3 were subsumed within other areas. It was recommended that a review of the C3 survey area take place 12 years from the date of the report.
- 3.5 Following assessment of the 2001 survey for EA10, the area limits were revised to better focus on areas of concern to shipping. The southwest part of the area was transferred to EA12, and the southern limit was extended to take account of sediment transport along Newcome Sand.
- 3.6 The 2004 survey of area EA12 determined the requirement and the frequency for resurvey. The northern portion transferred from EA10 was surveyed in 2001 and hence it was not considered necessary to resurvey the area in 2004.
- 3.7 Following the first assessment of area EA12 revised limits undertaken in 2004 the limits were again revised. The eastern limits adjusted to remove deep water and the southern limit extended to better encompass the southern end of the shoal and potentially mobile seabed.
- 3.8 Following the 2014 ten year survey of the area EA12, it was recommended that, a focused area EA12A incorporating Lowestoft South Road and Lowestoft Bank should be resurveyed in 2015 with a combination of full density survey of both named areas and 150 metre spaced check-lines in between.
- 3.9 Area specification and survey history shown at Annex A.

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

- 4.1 EA12A is a focussed area incorporating Lowestoft South Road, a deeper channel in the west and Lowestoft Bank to the east. It also incorporates an extremely shoal area in between these two features including small areas with drying heights up to 0.31 metres. The limits of area EA12A cover an area of 0.51 SQ NM (1.75 SQ KM). The geographical limits of area EA12A are given at Annex A.
- 4.2 An image of the 2015 survey overlaid on chart BA 1525, Lowestoft and Approaches (1:25,000) is shown at Annex C

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

- 5.1 Lowestoft South Road provides an unbuoyed inshore route close to the coast for shallow draught vessels. The area is understood to be used by local fishing vessels, leisure craft and some occasional small draught coastal traffic, with the main merchant traffic bound for Lowestoft keeping east of the area before entering the buoyed Stanford Channel
- 5.2 AIS shipping data for 2015 was examined and the data summarised in the illustration shown in Annex B. Most of the vessels approach via Stanford Channel from the south and pass close to Newcome Sand light buoy.
- 5.3 It has not been possible to establish the maximum size or draught of vessels that use the unbuoyed inshore area from the available AIS shipping data.

#### **6. 2014 SURVEY DETAILS**

- 6.1 The survey for area EA12, part of survey HI1458 was conducted from 26<sup>th</sup> July to the 1<sup>st</sup> August using the Wessex Explorer and 13<sup>th</sup> to the 14<sup>th</sup> September using the vessel named Echo. The area was surveyed using wide line spacing MBES with a SBES used in shoaler water. During survey activity, the weather experienced in the area was noted as being generally slight to moderate sea state with wind stated as being NE 4-5, Beaufort scale. It was

noted that significant weather down time was experienced during the routine resurvey survey operations.

- 6.2 Survey data was acquired using the Wessex Explorer hull mounted Kongsberg EM3002D multibeam echosounder. Infill operations over the shoalest areas were conducted using a Teledyne Odom Hydrotrack singlebeam echosounder. Observations calculated from the height component of the GPS position solution were used to reduce soundings to Chart Datum. Ellipsoidal Height to Chart Datum separation values were taken from the UKHO Vertical Offshore Reference Frame (VORF).
- 6.3 The final dataset was in the form of a 1 metre gridded Combined Uncertainty & Bathymetry Estimated (CUBE) surface and was validated by the UKHO and found to meet IHO S-44 (5th Edition) Order 1a Standard.

## **7. 2015 SURVEY DETAILS**

- 7.1 The survey was conducted between 22<sup>nd</sup> September and 9<sup>h</sup> December by the Wessex Explorer. The majority of the survey area was completed by 27<sup>th</sup> September; however the project was temporarily stood down on the instructions of the MCA from 14<sup>th</sup> October until 17<sup>th</sup> November 2015 due to extended periods of poor weather which was limiting survey operations. Once surveying restarted and following survey work in adjacent areas, the final part of EA12A was surveyed on 9<sup>th</sup> December.
- 7.2 Survey data was acquired using a Kongsberg EM3002D and EM2040C, hull mounted multibeam echo sounders. The primary horizontal reference was provided by an Applanix POS MV system together with GPS data from C&C technologies C-NAV 3050 DGPS and referred to the International Terrestrial Reference Frame (ITRF) 2005 Datum.
- 7.3 UKHO supplied Vertical Offshore Reference Frame (VORF) and GPS heights were used to reduce depths to Chart Datum (CD).
- 7.4 The final dataset was in the form of a 1 metre gridded Combined Uncertainty & Bathymetry Estimated (CUBE) surface and was validated by the UKHO and found to meet IHO S-44 (5th Edition) Order 1a Standard.

## **8. DESCRIPTION OF RECENT BATHYMETRIC CHANGE**

- 8.1 The 2015 survey of area EA12A consisted of a mix of full density and check line survey data. The 2014 survey of area EA12 which incorporates area EA12A was a check line survey only. For this reason the Profiles and Variability plot presented in Annex D and G respectively are based on a generalised and interpolated surface. However, the colour banded depth plots in Annex E and F are based on the shoalest valid soundings with no interpolation undertaken.
- 8.2 There are two small sections of the EA12A area where 2014 data was not available due to extremely shoal depths preventing survey coverage. The areas of non-coverage are evident in the Variability Plot at Annex G. The previous most recent survey to cover these areas was in 2009 which was deemed inadequate for a viable comparison.
- 8.3 Across the whole of area EA12A, the 3-metre contours in Annexe H shows apparent movement on the seaward side of Lowestoft Bank. This is deemed to be insignificant and due in part to different survey methodology between the 2014 and 2015 surveys. However, the 6-metre contour shown at Annex I, has expanded both east and westward by as much as 50 metres. It should be noted this apparent expansion could be an artefact of using the wide spaced survey lines undertaken in 2014 to interpolate the contours. Since 2014 the data indicates the 6-metre contour has extended south westerly to the south and north easterly to the north to outside of the survey limits.

- 8.4 The Selected depths plots, Annexes E and F, show a general, slight deepening of, commonly 0.4 metres. To the mid north of the area, Annex F shows a point which has shoaled by 2.3m.
- 8.5 The Variability plot in Annex G, based on interpolated surfaces, shows little change across the majority of the EA12A area.

## **9. IMPLICATIONS FOR SHIPPING**

- 9.1 There are limited changes in this area since the 2014 survey which lies away from the indicative shipping routes. As such the changes have no direct impact on shipping.

## **10. RECOMMENDATIONS FOR FUTURE SURVEYS**

- 10.1 Whilst there has been relatively little change in this area, the mobile nature of sediments in this area and the lack of recent comparable data in the northern section of the area justify maintaining area EA12A within the Routine Resurvey Programme.
- 10.2 It is recommended that this area be resurveyed 4 yearly, with the next survey being in 2019 to coincide with the next full survey of the adjacent EA10 area.
- 10.3 It is recommended that, due to the small size of this area and therefore the limited additional cost, the survey should be full density across the whole area in line with the EA10 area. With the survey lines run across Lowestoft Bank in the same locations to allow direct comparisons.
- 10.4 Following the 2019 Survey further consideration needs to be given as to the future survey schedule for EA12A and consideration should be given to combining areas EA12A and EA10

**AREA SPECIFICATIONS**

(Including Survey History)

**REGION:** East Anglia      **NAME:** Lowestoft South Road and Lowestoft Bank      **AREA:** EA12**LIMITS (WGS84 Datum):**

EA12 (10yr Interval)			EA12A (2015 Survey Area)		
A	52°23.26 N	1°43.49 E	A	52°28.00 N	1°45.00 E
B	52°24.98 N	1°44.26 E	B	52°28.00 N	1°45.00 E
C	52°25.52 N	1°44.10 E	C	52°27.30 N	1°46.02 E
D	52°25.95 N	1°43.94 E	D	52°27.30 N	1°44.45 E
E	52°26.78 N	1°44.12 E	E	52°28.00 N	1°45.00 E
F	52°28.00 N	1°45.00 E			
G	52°28.00 N	1°45.82 E			
H	52°25.51 N	1°46.76 E			
I	52°23.26 N	1°45.00 E			

**AREA SIZE EA12:** 5.7 SQ NM (19.6 SQ KM)**AREA SIZE EA12A:** 0.51 SQ NM (1.75 SQ KM)**SURVEY INTERVAL:** Additional 2015 focused area survey following 10 year survey of area EA12**SURVEYS:** (conducted at 1:25,000 scale (not applicable to multibeam surveys))

Year	Survey	File Ref	Data
1995	M2481	HH090/663/01	d
2001	HI999	HH090/999/01	d
2004	M4171	HH091/077/01	d
2014	HI1458	2014-142852	m
2015	HI1482	2015- 83468	m

**KEY:** d = digital data, m = multibeam digital data**ASSESSMENTS:** 1995 M2481 (HA145/02/003/05)

**REMARKS:**

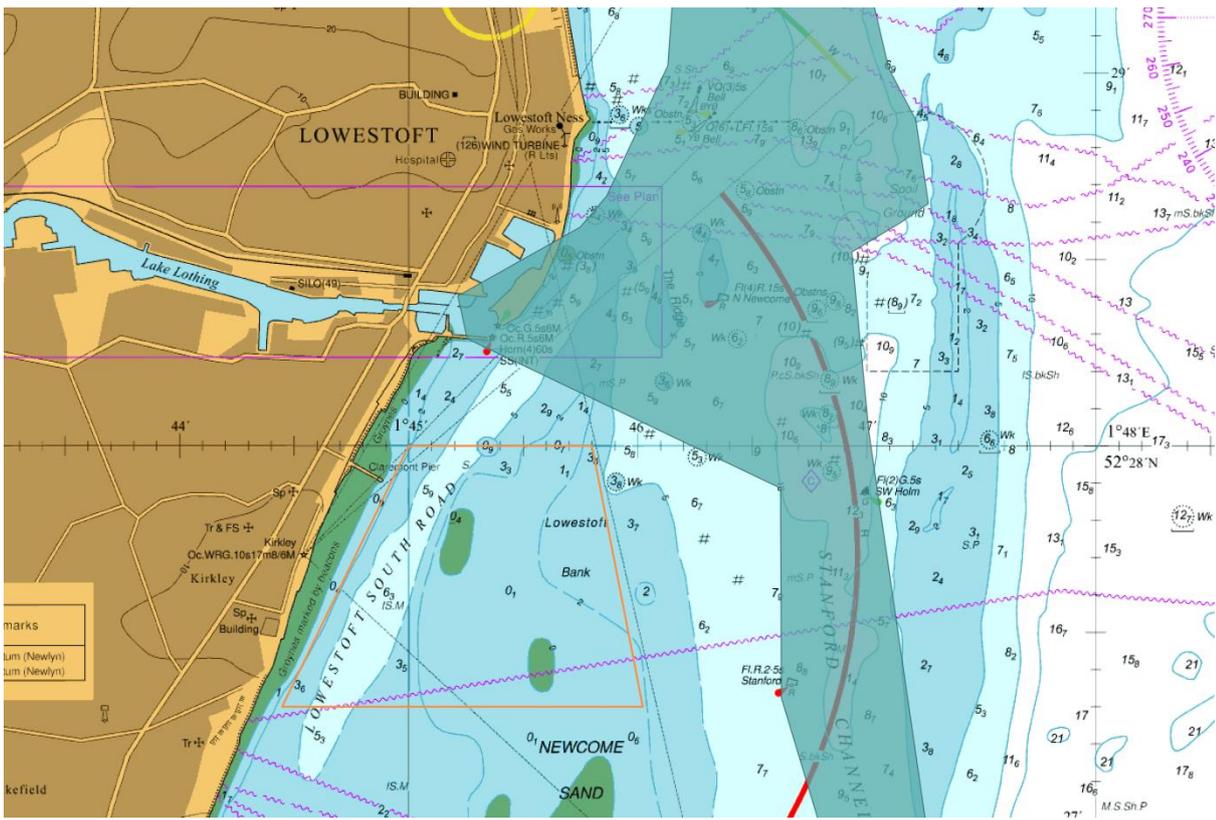
2002 Area limits extended following transfer from EA10 and extension of southern limit to include area of sediment transport

2004 Northern area of EA12 not surveyed, limits revised to remove deepwater and extended to over shoal and mobile seabed areas

2014 A focused area EA12A recommended for additional 2015 survey due to sediment movement observed to inform frequency of resurvey.

**LARGEST SCALE CHART:** BA1535 (INT1559) at 1:25,000)

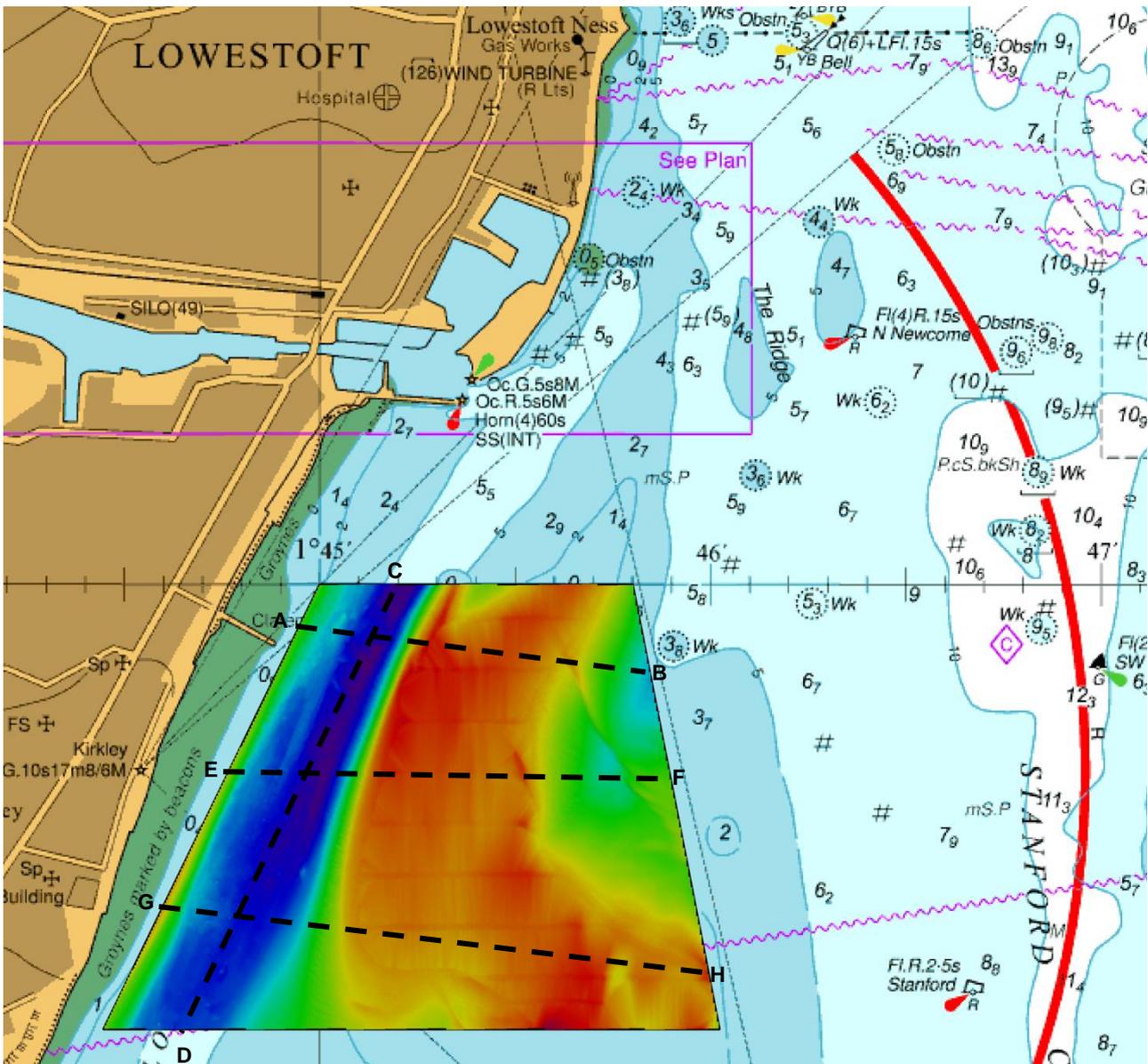
## SHIPPING ROUTES



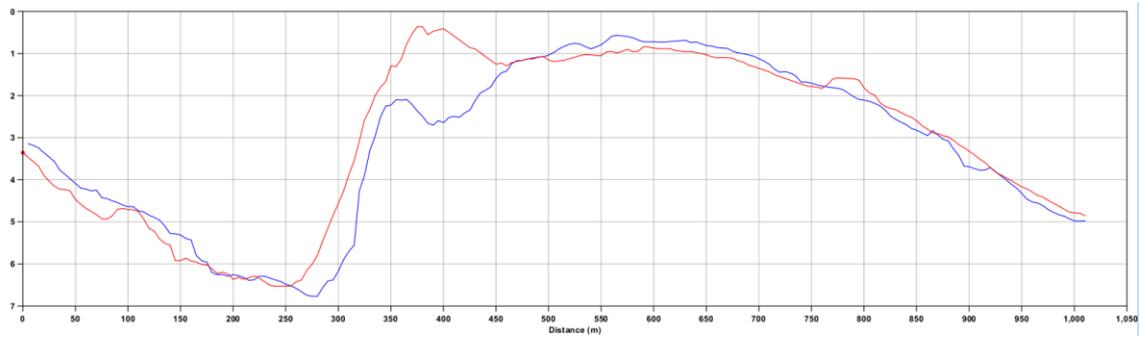
- Limits of EA12A Survey Area
- Indicative shipping routes through the area

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

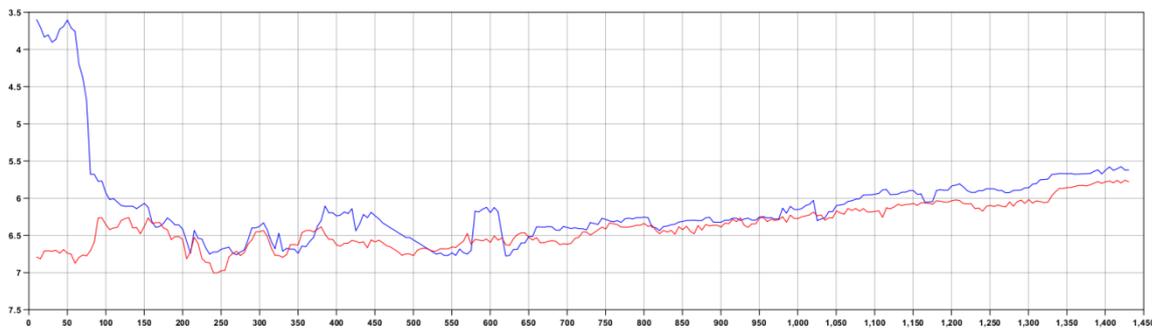
2015 SURVEY DATA OVERLAID ON CHART BA1535  
WITH LOCATION OF CROSS SECTION COMPARISONS  
(Shown at Annex D)



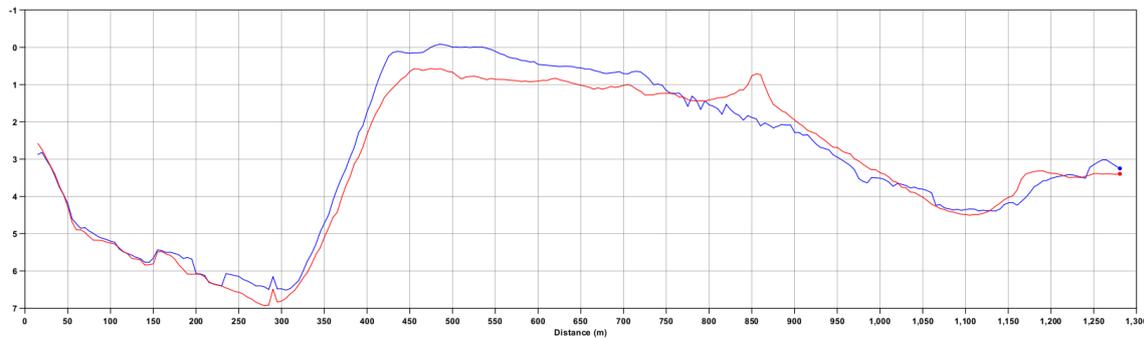
CROSS SECTIONS FROM THE 2014 and 2015 SURVEYS  
 (See Annexe C for locations)



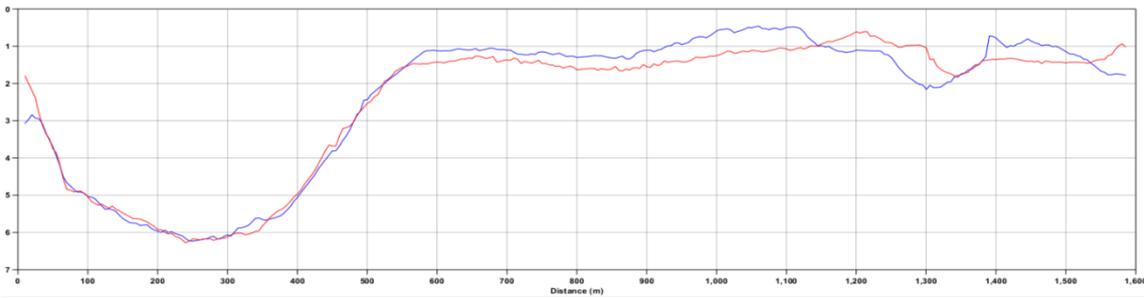
A Profile A-B B



C Profile C-D D



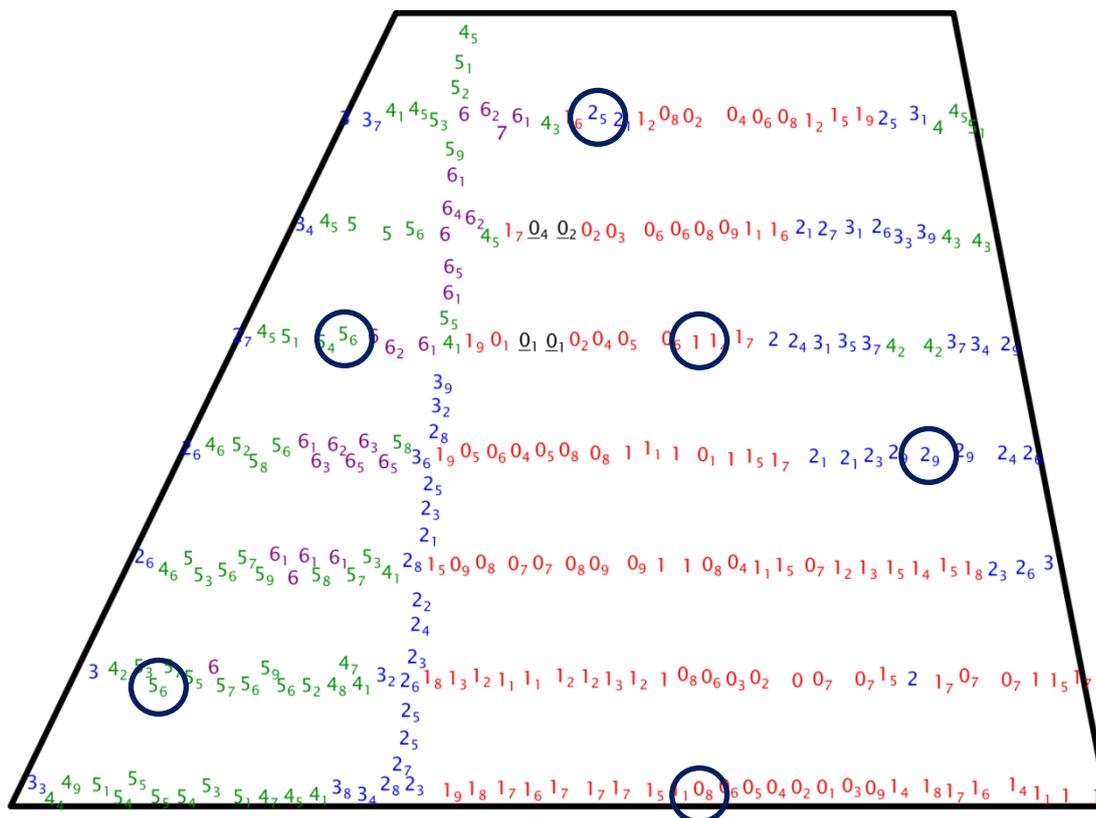
E Profile E-F F



G Profile G-H H

	2015
	2014

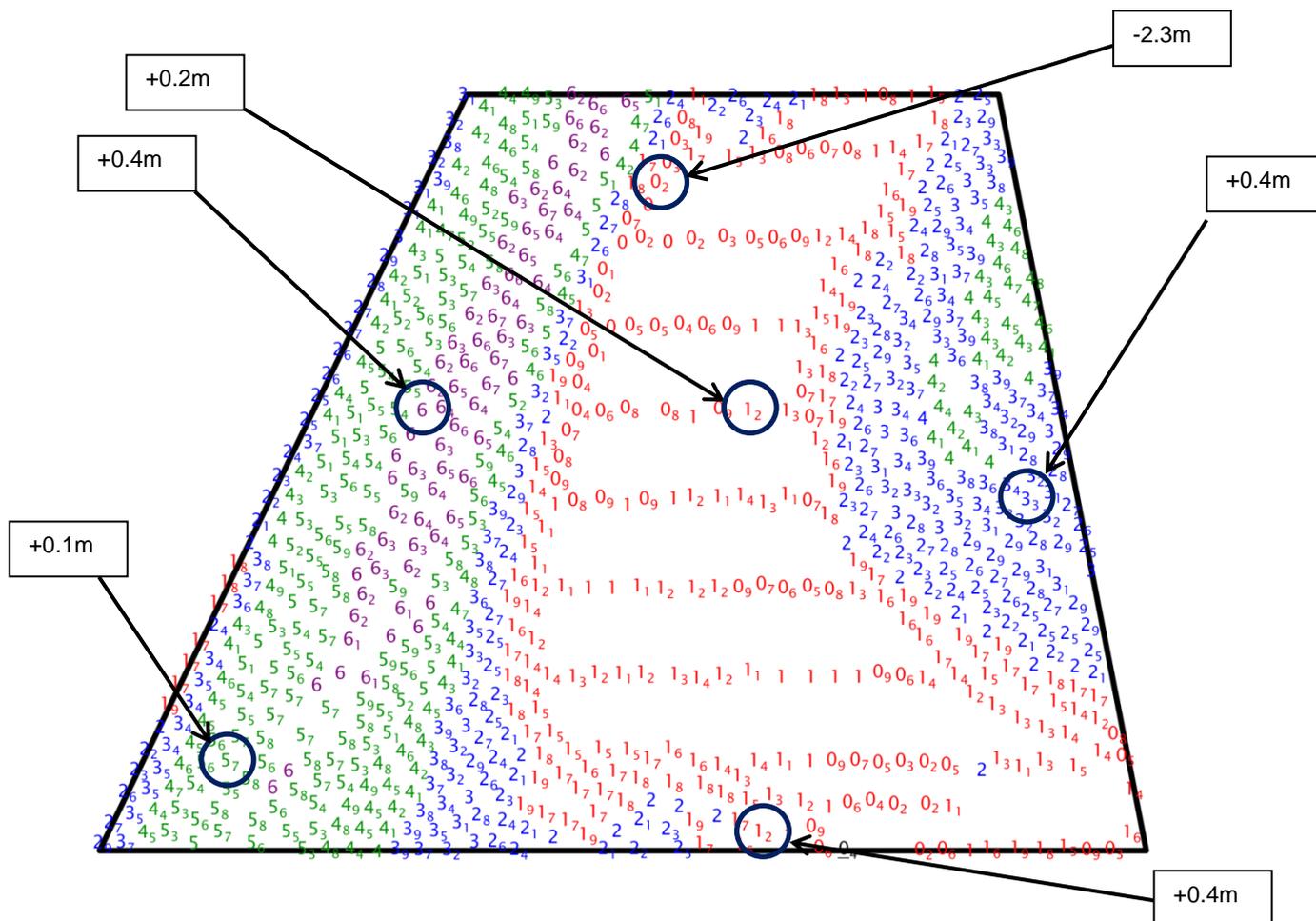
COLOUR BANDED DEPTH PLOT  
FROM THE 2014 SURVEY  
SHOWING SELECTED DEPTHS



 Selected depth comparisons

Depths in Metres	
	Dries
	0 to 2.0
	2.0 to 4.0
	4.0 to 6.0
	6.0 to 8.0

COLOUR BANDED DEPTH PLOT FROM THE 2015 SURVEY  
SHOWING SELECTED DEPTHS



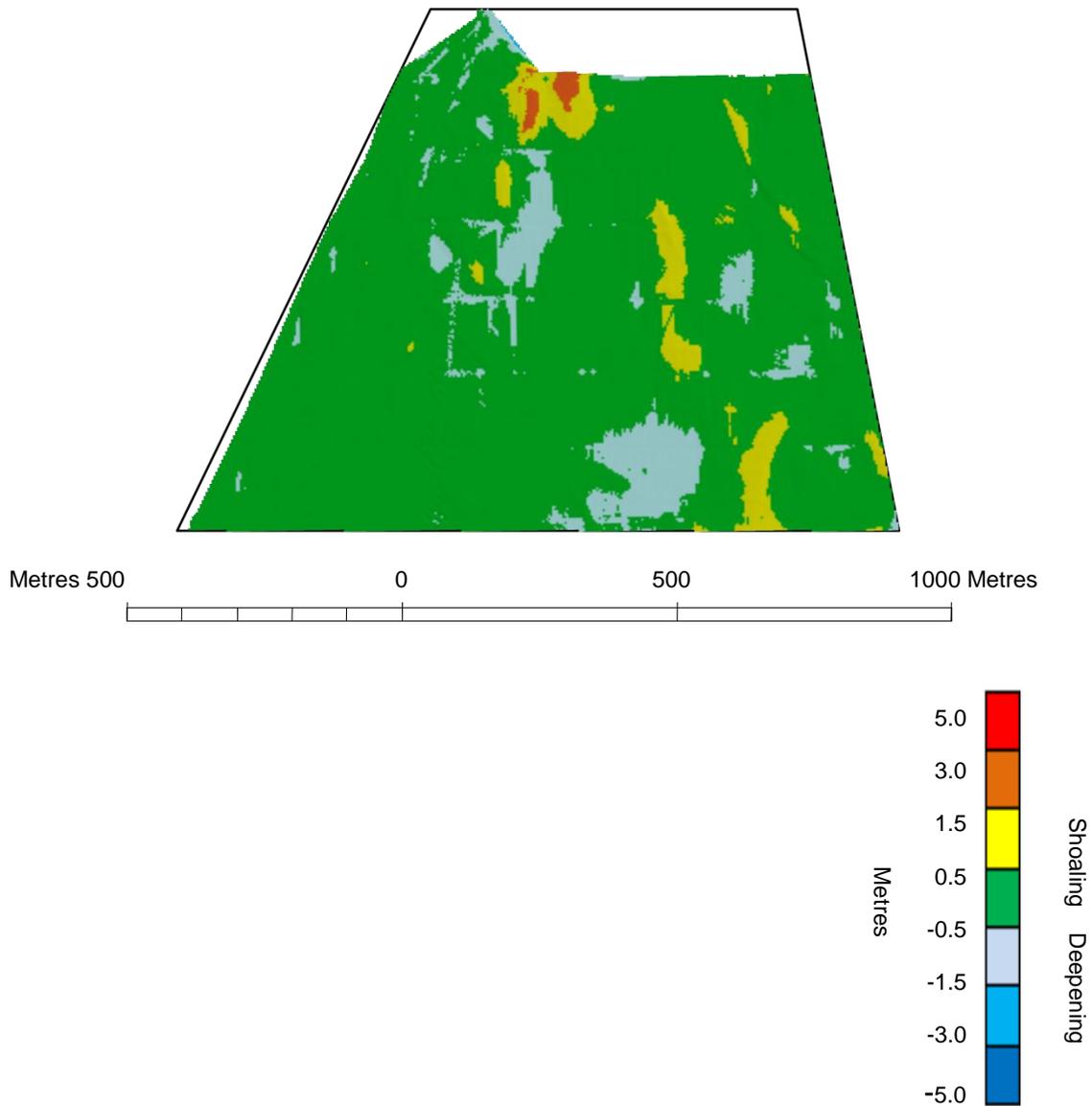
Deepening + Positive value / Shoaling - negative value

○ Selected depth comparisons

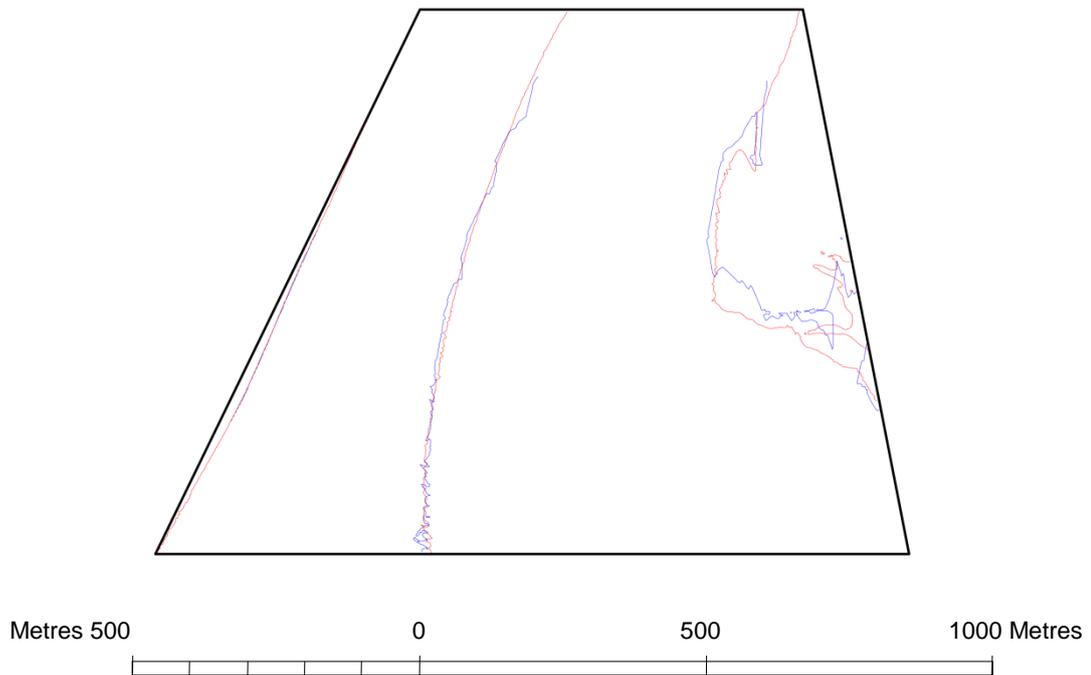
Note: Depth changes indicated above are from the closest corresponding 2014 sounding available. Hence depth differences will be from different positions from the 2015 sounding selection as an automatic shoal bias sounding selection tool has been utilised which produces a representation of the shoal values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

Depths in Metres	
	Dries
	0 to 2.0
	2.0 to 4.0
	4.0 to 6.0
	6.0 to 8.0

VARIABILITY PLOT SHOWING  
BATHYMETRIC CHANGES BETWEEN  
THE 2014 AND 2015 SURVEY DATA  
SCALE 1:15,000



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



Year of Survey	
	2014
	2015

