Cruise Report: **RV ENDEAVOUR; CRUISE 10A AND C / 09**

STAFF:

Part A	**Part C**
P Whomersley (SIC, Benthic ecologist)	P Whomersley (SIC, Benthic ecologist)
Roger Coggan (Benthic ecologist)	Suzanne Ware (Benthic ecologist)
Claire Mason (Sedimentologist)	Koen Vanstaen (GIS)
Andy Smith (Ecotoxicologist)	Verity Nye (Benthic ecologist)
Clare Jackson (Biologist)	Manuel Nicolaus (Marine biologist)
Koen Vanstaen (GIS)	Andrew Griffith (Benthic ecologist)
Verity Nye (Benthic ecologist)	Julie Bremner (Benthic ecologist)
Manuel Nicolaus (Marine biologist)	Louise Webster (Sedimentologist)
Andrew Griffith (Benthic ecologist)	Claire Mason (Sedimentologist)
Marc Wybrow (Electronics)	Jo Myers (Defra)
Louise Webster (Sedimentologist)	
David Stephens (GIS)	
Mariusz Huk (Chemist)	
Tobias Boehme (Engineer)	
Hans Ernst (Engineer)	

DURATION: Part A 16th June – 21st June
Part B 21st June – 11th July
Part C 11th July – 15th July

LOCATION: Part A North Sea
Part B North Sea, Eastern/Western Channel, Irish Sea
Part C Western Channel

AIMS:

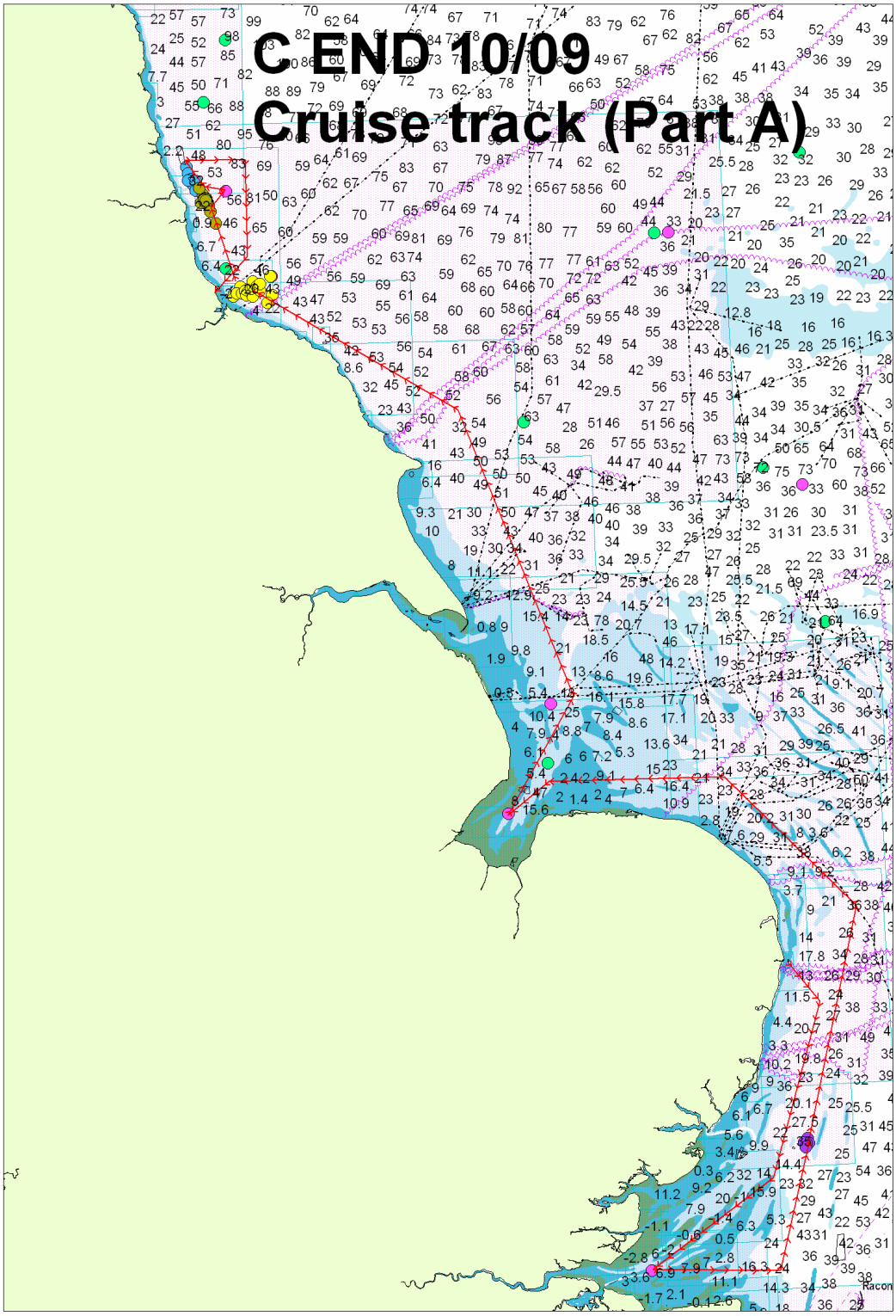
1. To survey dredged material disposal sites at Inner Gabbard, Tees, Souter Point, North Tyne and Rame Head (Plymouth) for benthos, trace metal and organic contaminants in sediments, using grabbing and coring. At a number of sites various acoustic methods will also be used.

2. To sample representative CSEMP locations using grabbing, coring, and trawl methods. Samples will be later analysed for trace metal and organic contaminants, litter and epi-, macro- meio- and microfauna.

3. To sample sediments and water at various stations in the eastern and western Channel regions for later analysis of macro- and meio- fauna, metals, chlorophyll a, porosity, organic contaminants, nutrients and salinity. This survey forms part of the CSEMP redesign program.

C END 10/09 Part A (16/06/09 – 21/06/09)

Figure 1 Cruise track (Part A)

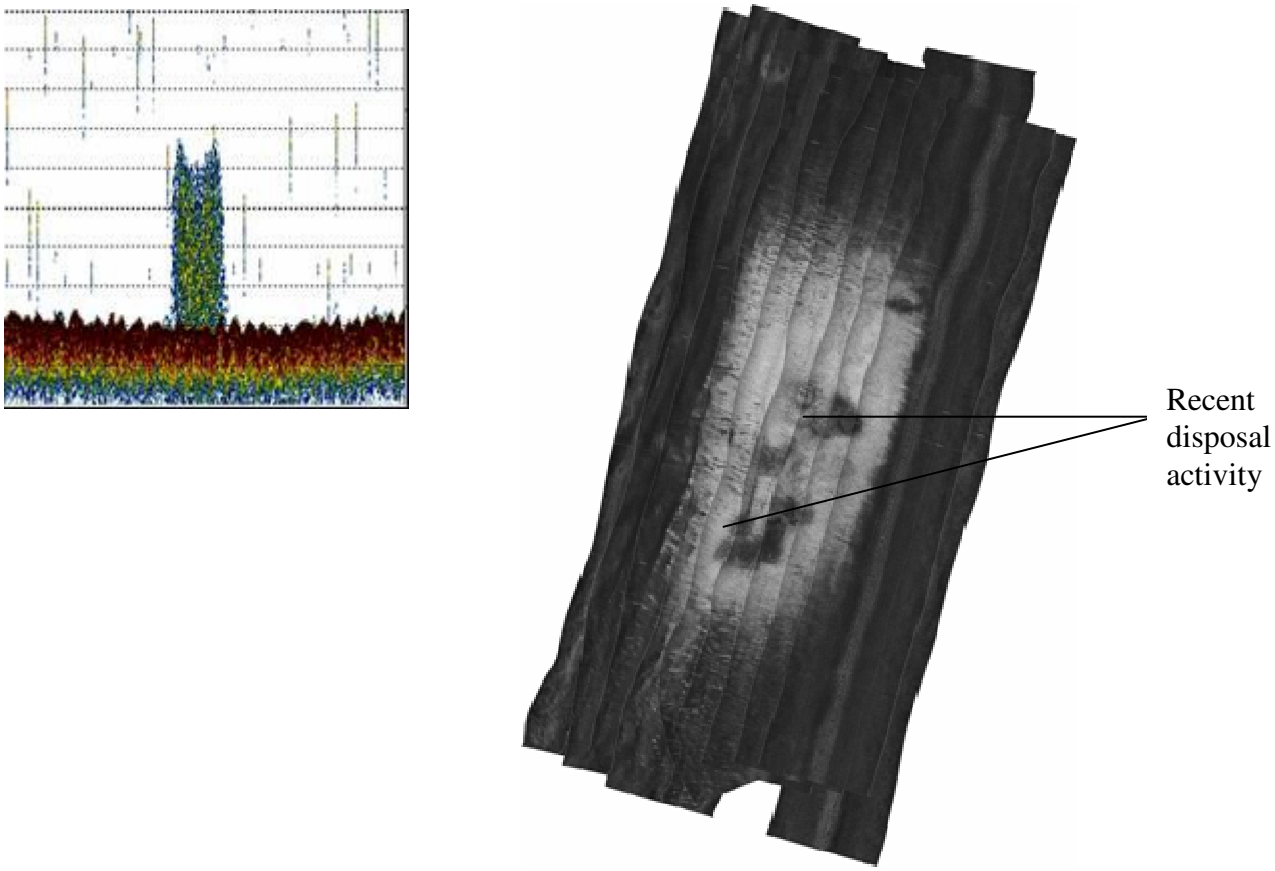


Cruise Narrative (16/06/09 – 21/06/09)

At 05:00 on 16/06/09 Cefas Endeavour sailed from Lowestoft and proceeded south to The Inner Thames where the Temporal CSEMP station 466 was sampled for biology

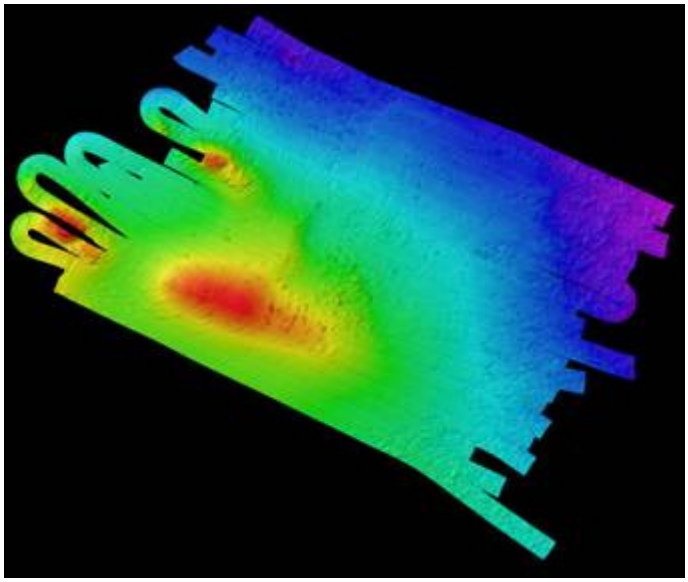
and contaminants (Aim2). Cefas Endeavour then transited east to the Inner Gabbard where a multibeam and sidescan (100% coverage) survey was conducted. During this survey disposal operations were underway resulting in fresh disposals being observed on the seabed and in the water column (figure 2). A Hamon grab survey for biology and particle size analysis (PSA) was then conducted (Aim1).

Figure 2 Preliminary processed sidescan image and seabed image of recent disposal activity At Inner Gabbard East.



On Completion of this survey Cefas Endeavour proceeded north (17/06/09) to survey CSEMP 376 and 386 temporal stations in the Inner and Outer Wash (Aim 2). From here Cefas Endeavour transited to the Tees dredge disposal site. On arrival at this site a multibeam survey (100% coverage) was conducted (Figure 3). Preliminary results from this survey revealed recent disposal activity within the centre of the disposal site. On completion of this acoustic survey a Day grab survey which consisted of samples taken for biological, sediment particle size and contaminant analysis was carried out (Aim 1).

Figure 3 Preliminary processed multibeam data of The Inner Tees disposal site.



Cefas Endeavour then continued north collecting biological, sediment particle size and contaminant samples from the temporal CSEMP station 295 (Aim 2). Cefas Endeavour then proceeded to the Souter Point dredge disposal site where a survey of the dredge disposal site and sediment cap used to contain TBT contaminated sediment was under taken (Aim 1). Several surveys were carried out, these include a Day grab survey for biology, sediment particle size and contaminants, Nioz Core and SPI surveys were undertaken to investigate the thickness of the cap and a multibeam and sidescan survey to investigate the bathymetry and sediment typology (no preliminary results available). During this survey the SPI camera failed to operate on several deployments resulting in the remaining stations being dropped. Attempts to fix the SPI camera were unsuccessful.

Cefas Endeavour then transited east (20/6/09) to sample the Off Tyne CSEMP temporal station 245 (Aim 2) before continuing north to carry out Day grab surveys at the historic Tyne sewage sludge disposal site and North Tyne dredge disposal site (Aim 1). On completion of these surveys Cefas Endeavour docked in Hartlepool to change scientific staff (21/06/09).

C END 10/09 Part B (21/06/09 – 11/07/09)

Please see Cruise report by Brett Lyons (Weymouth).

During part B a 24 hour multibeam survey was carried out to identify the location of a *Modiolus modiolus* reef north-west of Anglesey. (See inserted report). This survey which consisted of two grids was carried out by Koen Vanstaen, Paul Whomersley, Suzanne Ware and Manuel Nicolaus.

Modiolus modiolus survey report 2009

Contractor: CEFAS **Client: JNCC**

Vessel: RV Endeavour **GSM Data:** +44 7799 779023 **GSM Voice :** +44 7799 773456	**Project:** JNCC Contract **Satellite Voice Bridge:** 00871 763998027 **Satellite Voice Survey:** N/A
Daily Progress Report No. 01 **Date:** Sunday 05/07/09 – Monday 06/07/09	**Location at 24:00:**

To Company:	**Attention:**	**E-mail:**
JNCC	Neil Golding	Neil.Golding@jncc.gov.uk
Cefas	David Limpenny	David.limpenny@cefas.co.uk

Safety

	Today	**To Date**
Accidents/Incidents	0	0
Near Misses	0	0
Safety Drills/Induction	0	0

Summary of operations 0000-2400

Time UTC		**Type**	**Comments**
From	**To**		
09:00	12:45	Transit	Transit to Holyhead
12:45	13:30	Other	Waiting/Transfer survey staff from Holyhead to Cefas Endeavour by pilot boat.
13:30	14:15	Transit	Transit to NWA2 SVP station
14:15	14:45	TOSu	SVP profile at 53.38N 5.04W, 117m water depth
14:45	02:30	TOSu	Multibeam survey NWA2
02:30	04:00	Transit	Transit NWA2 to NWA1
04:00	04:15	TOSu	SVP profile at 53.637N 4.762W, 40m water depth
04:15	10:30	TOSu	Multibeam survey NWA1
10:30	13:00	Transit	Transit from NWA1 to Holyhead
13:00	13:15	Other	Transfer of survey staff from Cefas Endeavour to Holyhead

Weather

Weather/sea state conditions	**SUNDAY 05/07/2009**		**MONDAY 06/07/2009**		**Remarks**
	1200-1800	**1800-2400**	**0000-0600**	**0600-1200**	
	Wind: S, 11-14 Kn Wave: SW, 1.4m	Wind: S, 11-14 Kn Wave: SW, 1.4m	Wind: S, 11-12 Kn Wave: SW, 1.7m	Wind: SW, 7-8 Kn Wave: W, 1.6m	

Overall Progress

Type	***Today (hh:mm)***	***Accum (hh:mm)***		***Remarks***
Mob/Demob				
Offshore				

Calibrations				
Total Operation Survey	18:45			
Total Operation Sampling				
Equipment/Downtime				
Ship/Plant Downtime				
Waiting On Weather				
Transit	8:30			
Standby Port				
Others	1:00			Survey staff transfer
Total:	28:15			

Overall Progress Geophysical Data Acquisition MBES

Segment /Area/Line	***Today (Lkm)***	***Accum. (Lkm)***	***Current estimated total (LKm)***	***Remarks***
MBES lines NWA2	3.61 x 29	104.69		
MBES lines NWA1	3.05 x 18	54.90		
			Total MBES (Line Km)	159.59

Weather forecast for the next 24 hours

No further operations relevant to this contract

Planned operation for the next 24 hours

Continue monitoring survey

Agreed Changes to Scope/Survey operation priorities

No changes to agreed scope

CEFAS Comments

No additional comments

JNCC Representative Comments

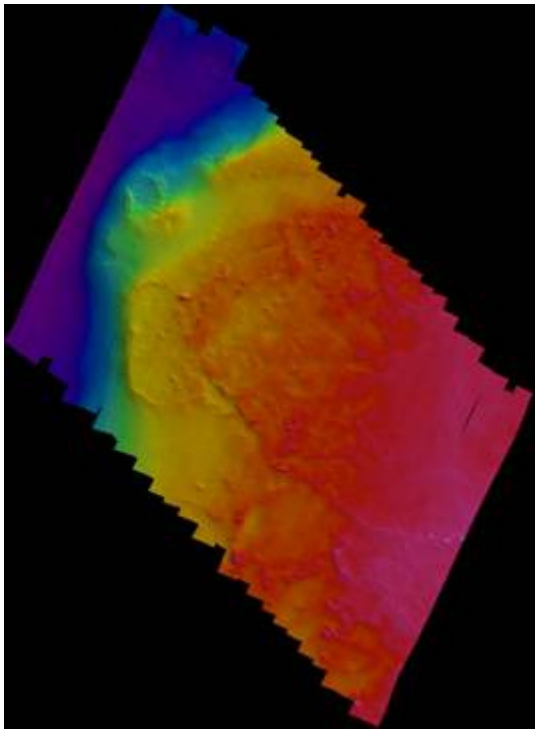
No additional comments

CEFAS Party Chief	JNCC Rep.
Paul Whomersley	n/a

Narrative

On Sunday 5th July 2008 around 11:00 Cefas Endeavour finished work at CSEMP fishing station "Red Wharf Bay" and started transit to Holyhead. At 12:45 Cefas Endeavour arrived at the meeting point outside Holyhead harbour. At 12:50 Cefas survey staff was collected from Holyhead Fish Quay by the harbour pilot launch. At 13:20 the pilot luanch arrived alongside Cefas Endeavour and the survey staff boarded Cefas Endeavour. At 13:30 Cefas Endeavour set sail for the northwestern corner of survey area NWA2. This location was chosen to start the survey due to the maximum survey water depth and therefore ideally suited to collect a sound velocity profile. At 14:15 Cefas Endeavour arrived at the SVP station (53.38N 5.04W) and the SAIV SD204 instrument was deployed in water depth of 117m. On completion of the sound velocity profile the data was downloaded and quality checked before uploading in the multibeam acquisition software, whilst Cefas Endeavour aligned itself to start the first survey line at 14:41. Multibeam survey operations continued at NWA2 until 02:21 on Monday 6th July 2009.

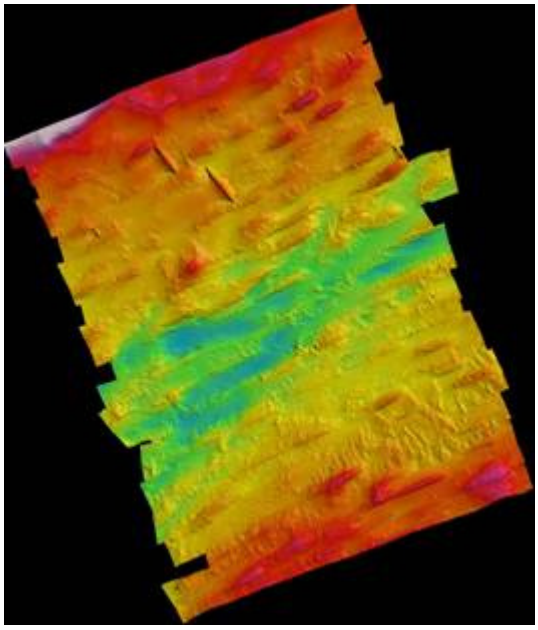
A preliminary review of the multibeam data revealed that water depths in area NWA2 varied from –125m in the northwest and sharply rises to a plateau at around –50m water depth. Whereas the deeper lying parts are relatively flat and featureless, the shallow areas display an irregular morphology at the seabed surface. The latter features vary in size and height, from 2 metres to several hundreds of metres in length, tens of metres wide, and up to 5m proud from the surrounding seabed.



On Monday 6th July 2009 at 02:21 transit was started towards survey area NWA1. At 04:00, a sound velocity profile was collected in the vicinity of NWA1 (53.637N 4.762W). On completion of the sound velocity profile the data was downloaded and quality checked before uploading in the multibeam acquisition software, whilst Cefas

Endeavour aligned itself to start the first survey line at 04:15. Multibeam survey operations continued at NWA1 until 10:32 on Monday 6th July 2009.

A preliminary review of the multibeam data revealed that water depths in area NWA1 varied from –113m in the central part of the survey area and -44m in the northwestern corner. The seabed morphology is characterised by a number of elongated ridges with an WSW-ENE orientation, varying in length from tens of metres to several hundreds of metres, and rising several metres from the surrounding seabed. Perpendicular to the orientation of these ridges, several symmetrical bedform features can be found throughout the area.



At 10:30 Cefas Endeavour headed southeast towards Holyhead to meet the pilot launch and transfer the survey staff back to shore.

In addtion numerous CSEMP temporal and CSEMP redesign stations were collected during transits between fishing stations (Table 1)

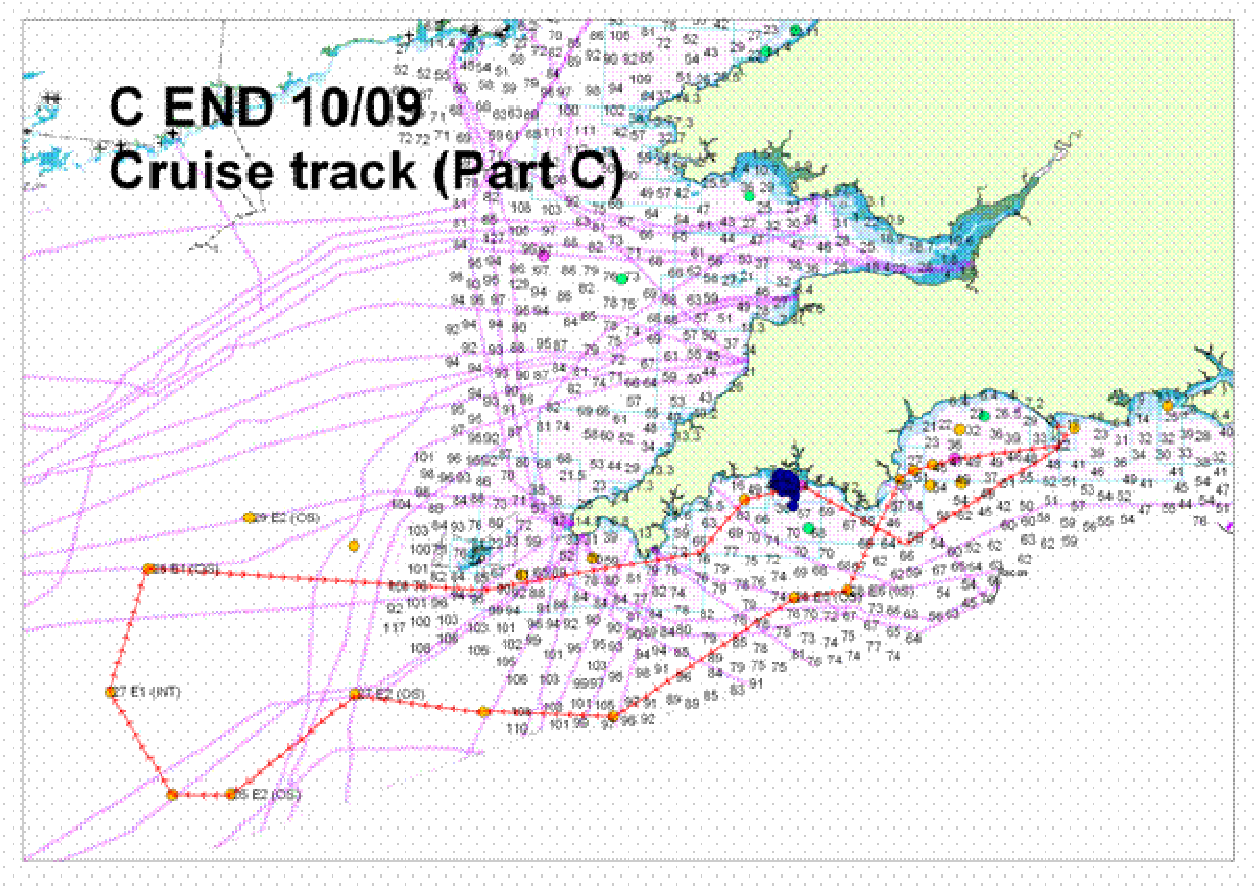
Table 1. CSEMP temporal and redesign station collected during transits between fishing stations

Date	Station
24/06/09	CSEMP 285
25/06/09	CSEMP 345
29/06/09	CSEMP 475
29/06/09	CSEMP 31 F1 (INT)
29/06/09	CSEMP 30 F1 (INT)
29/06/09	CSEMP 484
30/06/09	CSEMP 30 E9 (OS)
30/06/09	CSEMP 30 F0 (OS)
30/06/09	CSEMP 30 E8 (INSHORE)
01/07/09	CSEMP 30 E7 (INT)
01/07/09	CSEMP 29 E6 (INT)
01/07/09	CSEMP MUSD4
02/07/09	CSEMP MUSD3

02/07/09	CSEMP 30 E6 (INT)
03/07/09	CSEMP 605
04/07/09	CSEMP 655
06/07/09	CSEMP 715
07/07/09	CSEMP 805
10/07/09	CSEMP 29 E2 (OS)
10/07/09	CSEMP 28 E2 (OS)
10/07/09	CSEMP 28 E5 (INT)
10/07/09	CSEMP 28 E4 (INT)

C END 10/09 Part C (11/07/09 – 15/06/09)

Figure 4 Cruise track (Part C)



Cruise Narrative (11/07/09 – 15/07/09)

Cefas Endeavour departed Portland at 16:00 11/07/09 and sailed west into Lyme Bay were stations CSEMP 536 (Aim 2) MUSD 1 and MUSD 2 (Aim 3) were sampled for biology, sediment particle size and contaminants. From here Cefas Endeavour transited south collecting CSEMP redesign station 28 E6 (OS) and then west (12/07/09) collecting stations 28 E6 (OS), 28 E5 (OS), 27 E4 (OS), 27 E3 (OS), 27 E2 (OS), 27 E2 (OS), 26 E2 (OS), 26 E1 (OS) (Aim 3) then north (13/07/09) to sample stations 27 E1 (INT) and 28 E1 (OS) (Aim 3). Poor weather conditions during this section of the cruise resulted in the failure to collect some samples due to the grab

failing to operate optimally in deep water and rough seas. On completion of station 28 E1 (OS) Cefas Endeavour transited back inshore (14/07/09) to sample the final CSEMP redesign station 29 E5 (INT) (Aim 3) and begin work at the Rame Head dredge disposal site (Aim 1).
Due to the unconfirmed (by the Ministry Of Defence) condition of explosives disposed of at the Rame Head disposal site pre 1983, five stations within the disposal site boundary were abandoned. The decision to drop these stations was taken due to the unacceptable risk of bringing live explosives/ammunition to the surface in the grab or causing an underwater explosion during the deployment of the Hamon grab.
On completion of this Hamon and Shipek grab survey Cefas Endeavour travelled east to collect contaminant samples from CSEMP 575 (Aim 2). Two additional biology, porosity and chlorophyll a samples were collected so data from this station could be included in the CSEMP redesign program (Aim 3). On completion of this station Cefas Endeavour transited east and docked in Portland 09:00 on 15/07/09.

Summary

During all parts of this cruise several extra aims were achieved. These included the collection of microbiology samples and multibeam bathymetry and backscatter data from all CSEMP temporal stations for two separate postdoctoral studies. Several extra grab samples were also collected from the Inner Tees dredge disposal site. These extra samples were collected to allow bioassays aimed at investigating the toxicity of sediments to be conducted under controlled conditions.
During parts A and C the only gear that failed to operate optimally was the SPI camera. There was no down time due to bad weather or failure of ships systems which resulted in all primary and secondary aims being successfully achieved.

Paul Whomersley (SIC)