

Cruise report C END 11/10

Summary

All primary aims were achieved during C END 11/10 parts A,B and D.

The priority main and bulk stations of the North Sea biogeochemical transect were all successfully collected. With one exception (where sampling was not permitted at a bulk site due to an exposed pipeline)

All planned survey works and grab surveys were successfully carried out at the tier one dredge disposal sites.

Grab and beam trawl samples were successfully collected from the nominated CSEMP temporal monitoring stations.

Baseline drop camera surveys of the Lizard Peninsula and Cape Bank proposed Special Areas of Conservation were successfully carried out.

Opportunistic samples were collected from historic North Sea Benthos sites.

In addition to completing all the above aims additional stations were added into the programme to aid in the evaluation of ecohydrodynamic units identified in the North Sea.

The ships giro's and multibeam system were both calibrated during this cruise to ensure that all acoustic data acquired was of the highest quality.

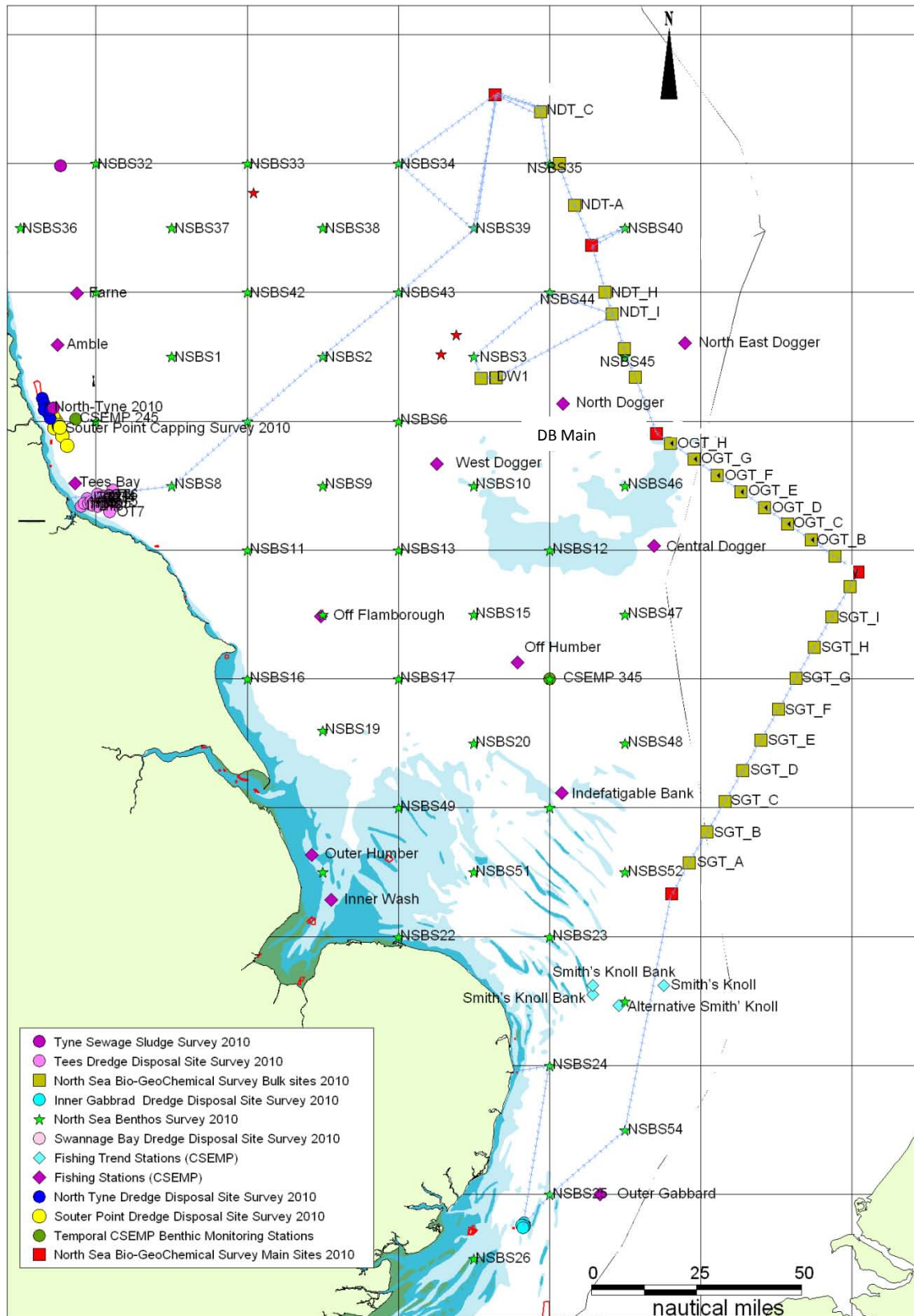
C END 11/10 A-B

Primary Aims

- 1.** Undertake detailed evaluation of sediment and seawater at three established sites in the North Sea representing different ecohydrodynamic units.
- 2.** To survey dredged material disposal sites at Inner Gabbard, Tees (Inner and Outer), Souter Point, North Tyne 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. Potential effects of Swanage Bay disposal site on the Dorset coast SAC will be assessed using a combination of underwater camera and grab techniques.
- 3.** To sample representative CSEMP stations using grabbing, coring, and trawl methods. Samples will be later analysed for trace metal and organic contaminants, litter and epi-, macro- and meio- fauna.
- 4.** To collect biological and physical samples using the Day grab from historical North Sea Benthos Stations

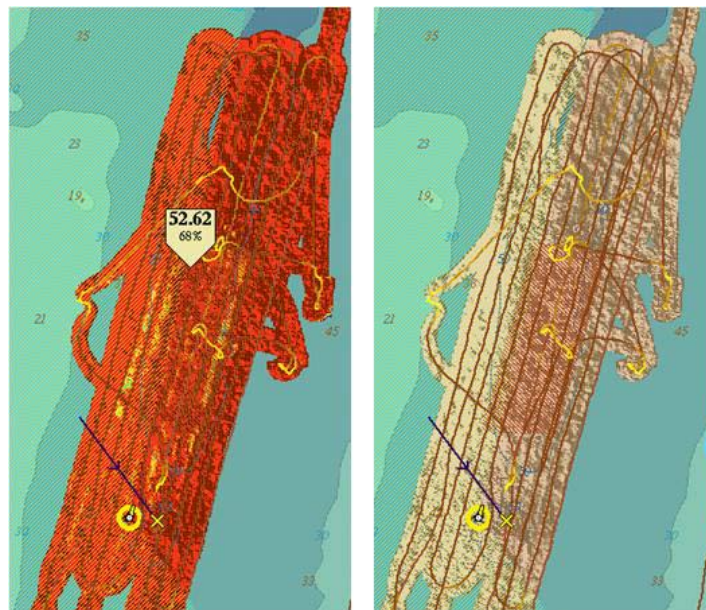
C END 11/10 A

Figure 1. Cruise track C END 11/10 A



CEFAS Endeavour sailed from Lowestoft at 16:00 05/06/10 after which a dynamic positioning assessment/ calibration exercise was carried out. The surveyor left the ship on the pilot boat at 20:30. From here CEFAS Endeavour transited east to a North Sea Benthos Station (NSBS) (AIM 4). This station (NSBS 24) was abandoned after 6 no samples due to coarse substrate. At 22:00 CEFAS Endeavour transited south to the Inner Gabbard where a sidescan and multibeam survey was carried out (Figure 2). Initial problem with the tow cable resulted in the Edgetech dual frequency sidescan fish being changed for the Benthic 1640 sidescan fish. On completion of this survey a Hamon and Shipek grab survey consisting of 5 stations was completed (AIM 2).

Figure 2. Sidescan survey of Thames Inner Gabbard dredge disposal site 2010



CEFAS Endeavour then transited north east to NSBS 25 and NSBS 54 (AIM 4). Samples were successfully collected at both stations. A test of all equipment (hired NIOZ corer, SPI camera and CTD rosette) was then carried out at a site just North of NSBS 54).

The equipment test revealed issues with all three pieces of equipment.

- The action of removing the firing pin resulted in the pin flying towards the operator
- CTD rosette software would not communicate with the rosette
- SPI camera flash system was un-operational

The problems with the CTD rosette software and the SPI camera flash system were both rectified before the equipment was deployed. The firing pin removal issue was later resolved by attaching the firing pin to the grab by a small length of chain and a rope with a float attached to prevent it becoming entangled in the grab during deployment and recovery. A later modification to the cocking method eliminated this issue entirely.

CEFAS Endeavour then transited north east to the southerly tip of the North Sea Biogeochemical Transect (main station SG) 06/06/10 (AIM1).

During operations at station SG the NIOZ corer became detached from the coring wire while on the sea bed. This was due to the failure of the split pin which held the main lifting pin.

The NIOZ was subsequently recovered using the wire creeper grapnel. This incident resulted in no disruption to the scientific programme. (Near Miss form to be submitted)

Resultant actions included the attachment of a new wedge socket and holding pins to be checked on a daily basis.

Also while at this station the requirement of the 2m Jennings beam trawl resulted in a new wire having to be added to the port side net drum due to the in operation of the starboard side. This was again carried out with no disruption to the scientific programme.

CEFAS Endeavour continued to transit in a north easterly direction collecting the biogeochemical bulk stations SGT_A – D (AIM 1). Station SGT_E was dropped due to its proximity to an unprotected seabed pipe line (07/06/10). The remaining SG transect stations were collected successfully (SGT_F – J) before CEFAS Endeavour arrived at the Oyster Ground (OG) main station (08/06/10). On completion of this station CEFAS Endeavour transited in north westerly direction collecting samples successfully from all OG transect stations (OGT_A-H) before arriving at the Dogger Bank (DB) main station (09/06/10).

Loose turns were observed on the CTD winch which resulted in 30m of wire being removed and the remaining wire being re-terminated. (Near Miss Form to be completed)

This was carried out with no disruption to the scientific sampling programme.

During the transit to the main DB station the old coring wire was replaced with a new one, again with no disruption to the scientific sampling programme.

After completion of this station (10/06/10) CEFAS Endeavour transited in a north west direction collecting bulk stations NDT_K-I and North Sea Benthos Station NSBS 45. After completing station NDT_I CEFAS Endeavour transited in a south west direction to sample stations Dogger West (DW) 1-3. These stations were added to the original programme to investigate changes in geochemical profiles and biological communities in relation to sediment particle size (AIM 1). During the transit back to the main transect NSBS stations 3 and 45 were sampled (AIM 4).

On return to the transect stations NDT_H and North Dogger main station were collected (11/06/10). CEFAS Endeavour then diverted from the transect to collect NSBS 40 before returning to the transect and collecting samples successfully from NDT_A, B and NSBS 35. At

station NDT_C deteriorating weather conditions (strong winds and poor sea state) resulted in the part completion of this station. It was deemed unsafe to deploy the Nioz corer and SPI camera. CEFAS Endeavour then proceeded to the Dogger Trench (DT) Main station. While at this station work ceased at 13:00 12/06/10 due to bad weather and poor sea state.

Weather down time 13:00 – 16:00 12/06/10.

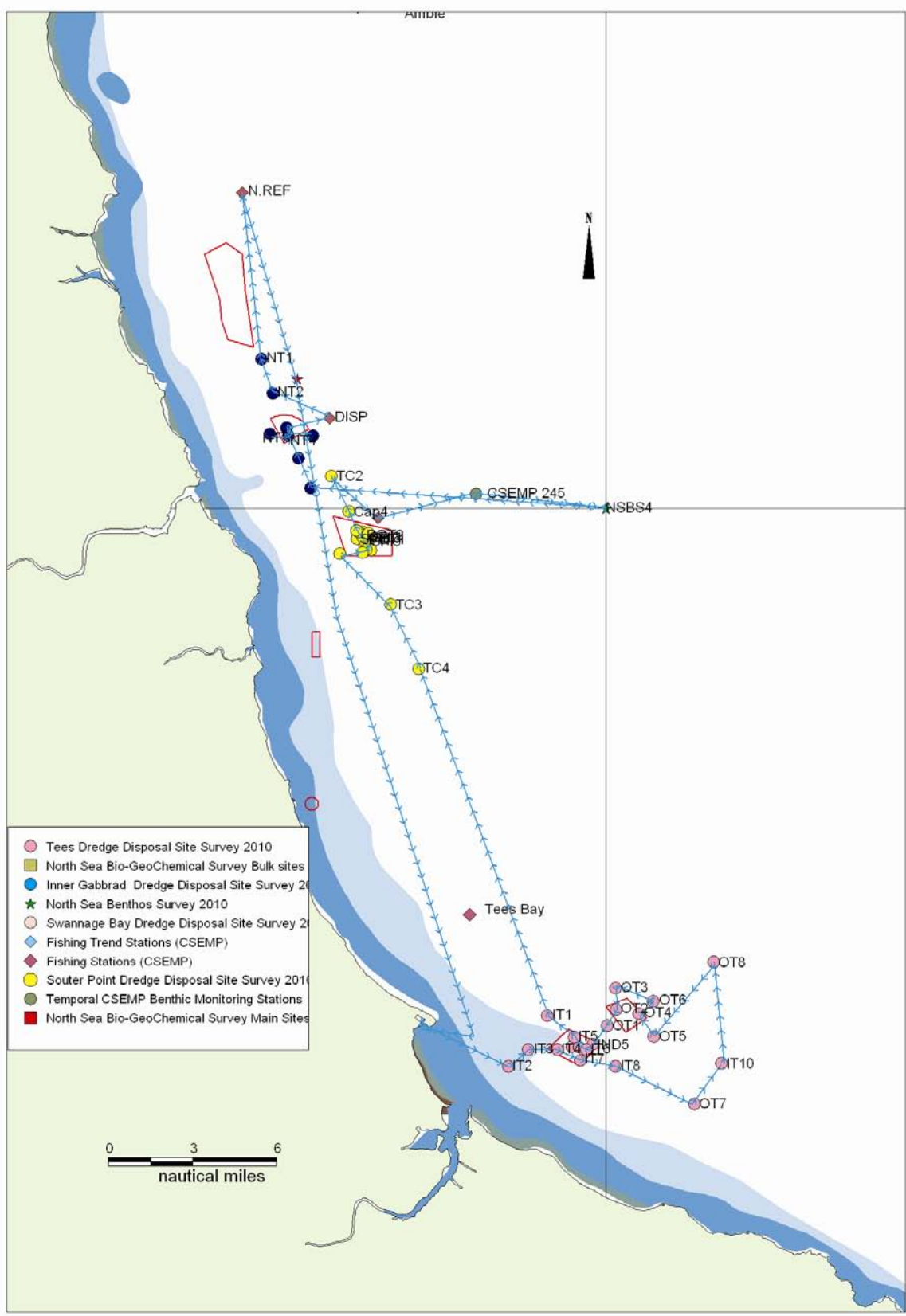
Strong winds and poor sea state resulted in 3 hours down time.

It was deemed unsafe to deploy the NIOZ corer, CTD rosette and SPI camera.

At 16:00 (12/06/10) it was decided to transit south to NSBS 39 in the hope that during the 3 hour transit time the weather would improve allowing the deployment of all necessary sampling gears. On arrival at NSBS 35 the Day grab was deployed unsuccessfully due to the amount of swell. From here Cefas Endeavour transited North West to NSBS 34 where samples were collected successfully. Due to improving weather conditions CEFAS Endeavour then transited back to the DT main station. On arrival weather conditions and sea state were still deemed unsuitable for gear deployment so it was decided to transit back to NDT_C to complete the station. On arrival at NDT_C all remaining samples were collected. On completion of this station CEFAS Endeavour returned to NSBS 39 where samples were collected successfully (14/06/10). Cefas Endeavour then transited in a south westerly direction collect samples from 4 NSBS stations (NSBS 43, 2, 5 and 8). Additional samples for Aim1 were also collected at these stations, providing valuable comparators for the pre-planned transects. CEFAS Endeavour then proceeded to the port of Hartlepool to carry out a planned crew change. While in port a giro calibration exercise was carried.

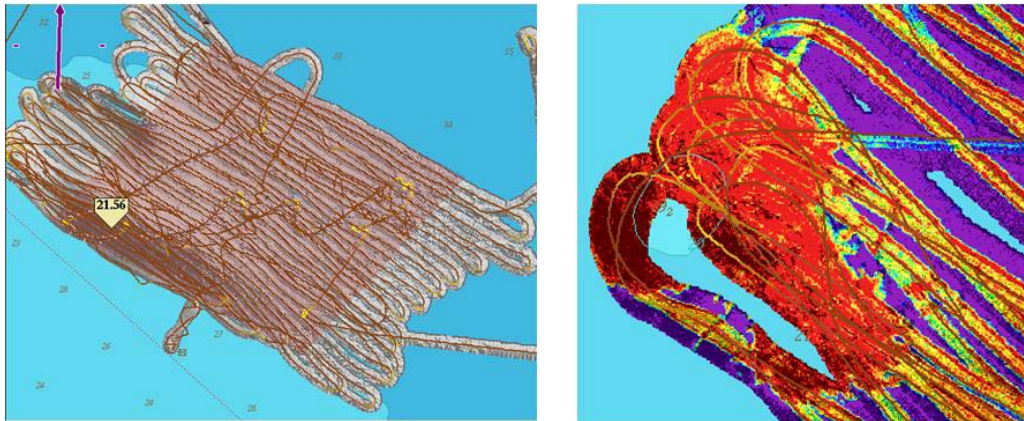
C END 11/10 B

Figure 3. Cruise track C END 11/10B



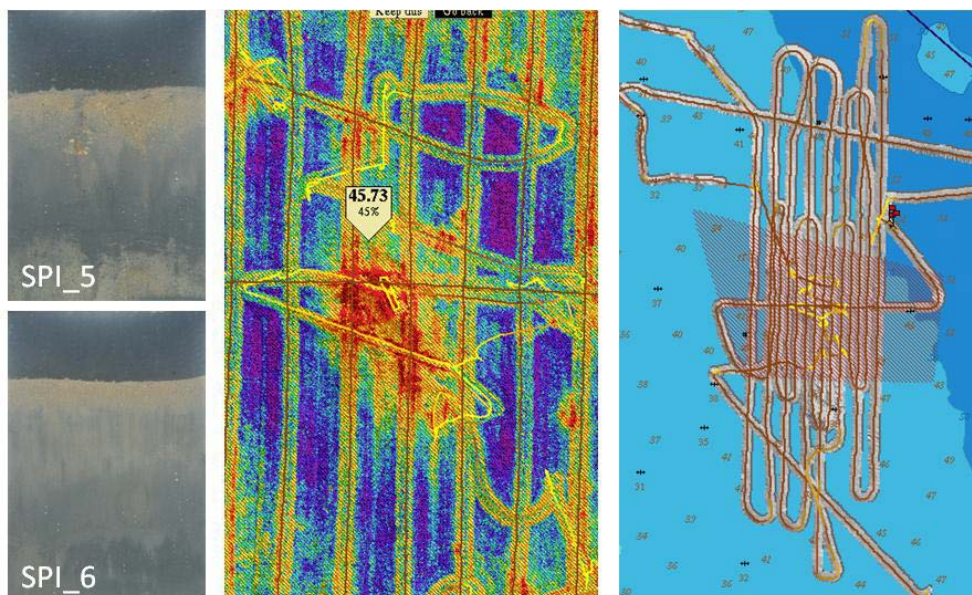
CEFAS Endeavour departed Hartlepool at 05:00 15/06/10 and transited to the Tees dredge disposal site and carried out the Day grab survey (AIM 2). On completion of this survey a multibeam survey (Figure 4) was conducted. During this survey the dredger Cleveland County was observed actively disposing in the south west corner of the disposal site (16/06/10). During transits between stations a wreck was identified as a potential multibeam calibration site.

Figure 4. Sidescan and multibeam image from Inner Tees dredge disposal site



On completion of this survey CSEMP station 295 (AIM 3) was collected before CEFAS Endeavour proceeded in a northerly direction to Souter Point dredge disposal site (AIM 2) where Day grab, Nioz, SPI, multiBeam and sidescan surveys were successfully carried out (Figure 5)

Figure 5. Images from the Sediment Profile camera and outputs from the multibeam and sidescan survey carried out at Souter Point dredge disposal site



CEFAS Endeavour then proceeded in an easterly direction collecting samples from CSEMP station 245 and NSBS 4 before transiting back inshore to begin work at the North Tyne

dredge disposal site and former sewage sludge transect (AIM 2). On completion of this work CEFAS Endeavour transited south to the previously identified wreck where a full multibeam calibration survey was carried out.

MultiBeam Calibration

A multibeam calibration was carried out to ensure that the acquired data met the agreed standards of the MOU (members include Defra, UKHO, Cefas, BGS, JNCC, NE, MCA) whereby data can be collected once and used many times.

On completion of the multibeam calibration exercise CEFAS Endeavour transited back to Hartlepool, docking at 10:00 19/06/10.

In port weather down time 24hours 19-20/06/10.

As all primary aims had been achieved it was decided to dock 24 hours early due to a deteriorating sea state and a very poor forecast.

C END 11/10 D

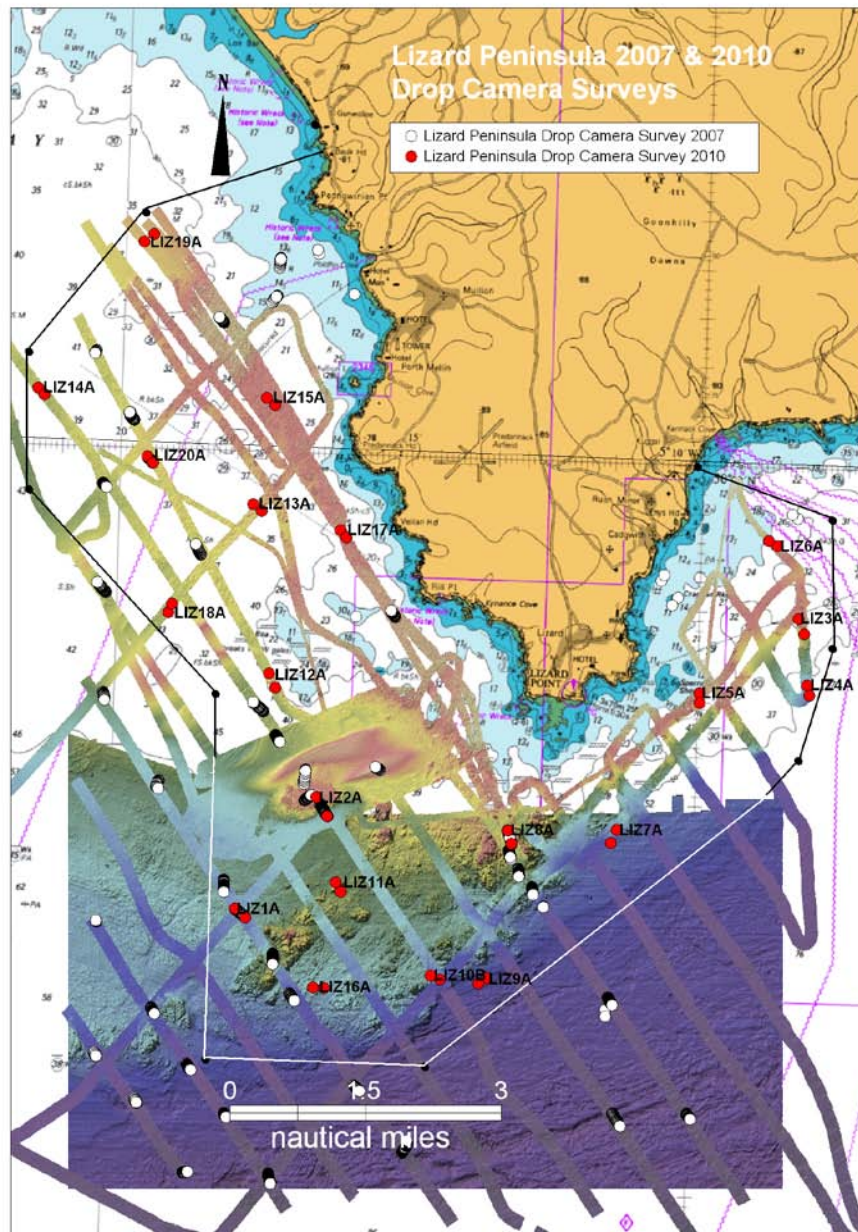
Primary aims

- 1.** To carry out a baseline survey of the Lizard Peninsula and Cape Bank proposed Special Areas of Conservatio using a drop camera.

Seabed features such as the base of rocky outcrops, ridge tops, gullies and slopes at different aspects were specifically targeted (using existing bathymetric data) and surveyed using a drop camera frame. Tows consisted of transects of ~200m in length. During these tows still images were taken every minute and when items of specific interest were observed.

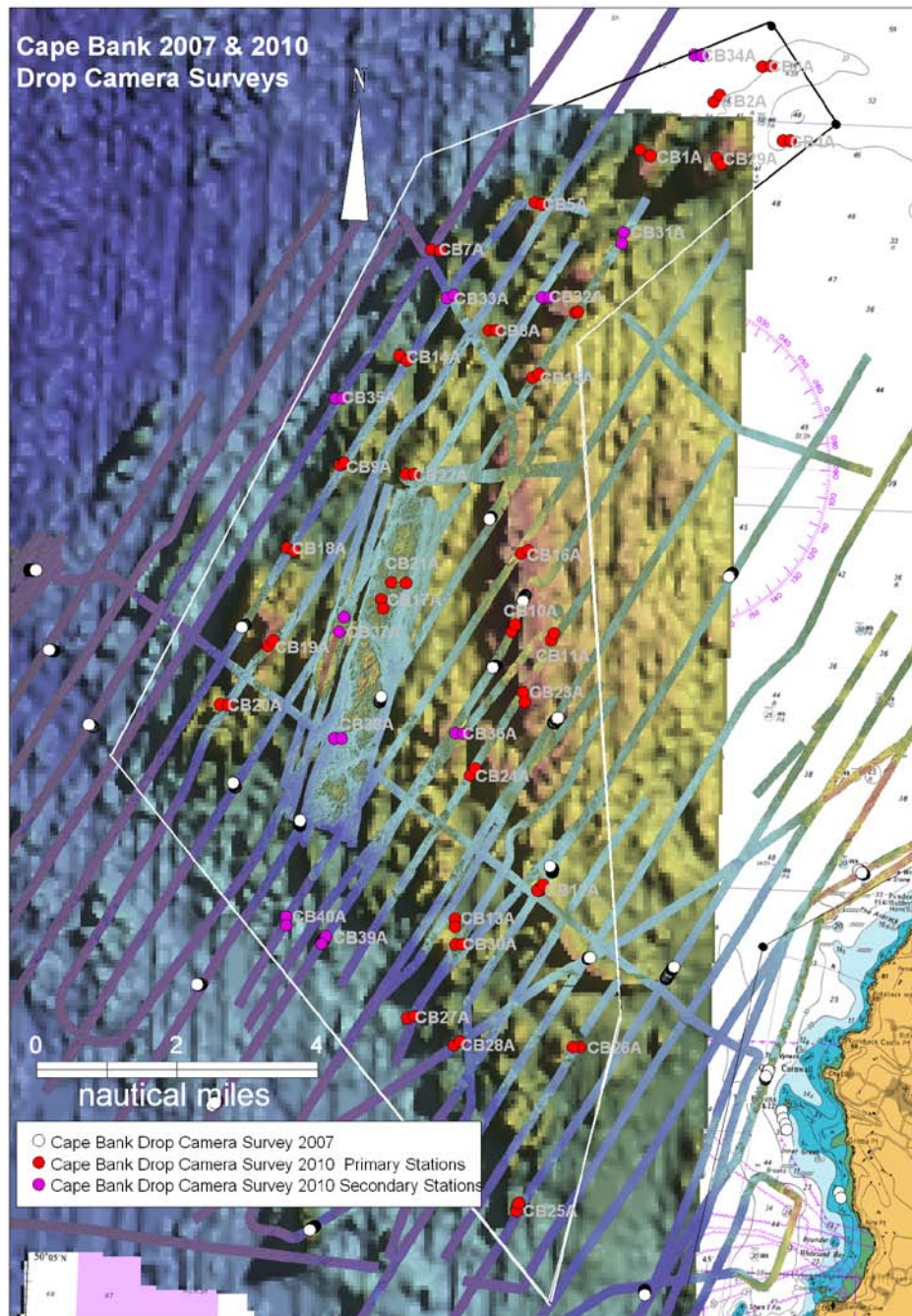
- 2.** To assess the potential effects of Swanage Bay disposal site on the Dorset Coast SAC using a combination of underwater camera and grab techniques.

Figure 6. Lizard peninsula proposed Special Area of Conservation (SAC) survey plan



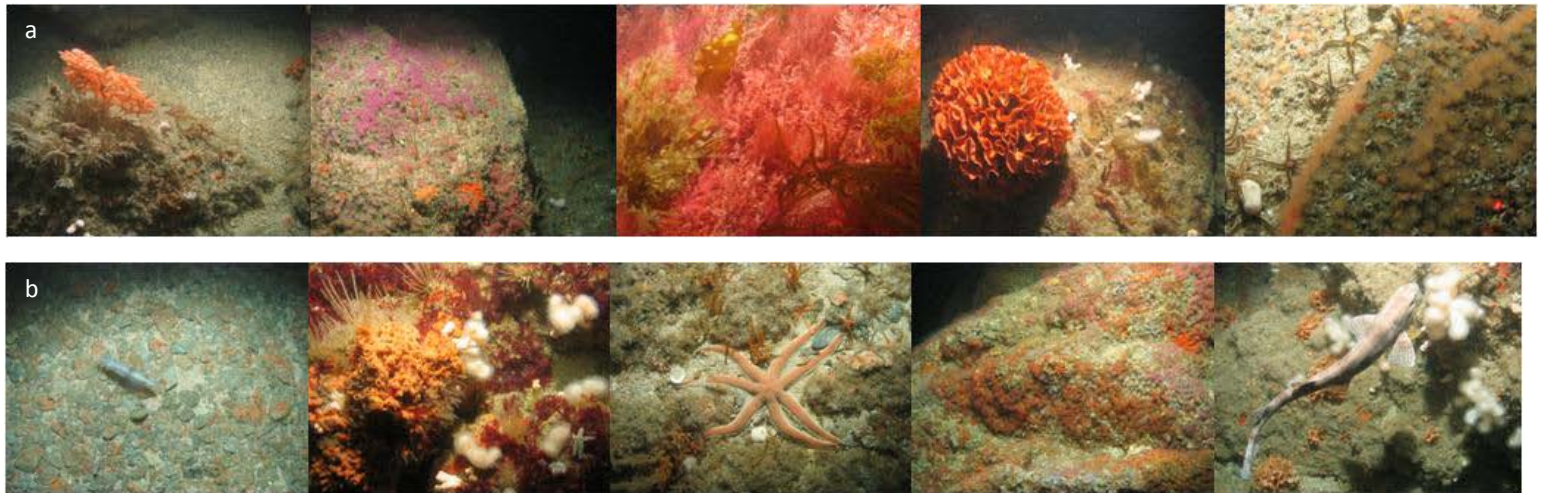
CEFAS Endeavour departed Falmouth at 19:00 09/07/10 and headed west to the Lizard Peninsula. Due to a poor weather forecast it was decided to begin surveying at the Lizard Peninsula (Figure 6) rather than transiting directly to the Cape Bank. On arrival at The Lizard Peninsula (19:45) a Sound Velocity Profile (SVP) was carried out before the Drop Camera (DC) was deployed at the first station. Twenty camera tows (Figures 6 and 8) were carried out within the proposed Special Area of Conservation (SAC) (19:47, 10/07/10) before CEFAS Endeavour transited west around Lands End and commenced work within the proposed SAC at Cape Bank (02:00, 11/07/10)(Figure 7).

Figure 7 Cape Bank proposed Special Area of Conservation (SAC) survey plan



On arrival (01:30, 11/07/10) a further SVP was carried out before the first DC transect was completed. In total 40 DC deployments (Figures 7 and 8) were carried out within the proposed Cape Bank SAC. These stations were split into primary and secondary stations. The primary stations were completed first to ensure that the whole area of the SAC was adequately covered. Once these stations had been completed the secondary stations which focussed on areas of particular interest e.g. areas where data was lacking and prominent seabed features were then completed (01:00, 13/07/10).

Figure 8 A selection of images depicting the diverse habitats observed during the surveys at the (a) Lizard Peninsula and (b) Cape Bank proposed SACs.



On completion of this work CEFAS Endeavour proceeded east to Swanage Bay where a combined DC and Shipek grab survey was conducted to assess the potential effects of Swanage Bay disposal site on the Dorset Coast SAC (02:30, 14/07/10).

For the duration of part D a Marine Mammal Observer linked to the CHARM initiative was onboard. During this time several pods of common dolphins were observed, photographed and logged.

On completion of the Swanage Bay survey CEFAS Endeavour travelled west to Portland where she finally docked at 07:30 on 14/07/10.