CEND 11b/11 Cruise Report

RV Cefas Endeavour Cruise 11b 2011

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DURATION
23rd June - 4th July 2011

LOCALITY
Dogger, Humber, Thames, Tyne

AIMS

1. To survey dredged material disposal sites at the Inner Gabbard East (outer Thames estuary), North Tyne, Souter Point (Tyne) and Tees Bay, for benthos, trace metal and organic contaminants in sediments, using grabbing and coring. At some of the sites the SPI camera and various acoustic methods were also used.

2.
    a) To undertake detailed biogeochemical evaluation of sediments and the water column at randomly selected stations in the North Sea to test the validity of the 4 Ecohydrodynamics Units (EHUs) derived from modeled environmental data.
    b) To incorporate stations within the sampling plan which reflect a range of fishing pressures according to VMS data on Beam and Otter trawls to assess the impact of fishing on the seabed within an EHU.

3. Deployment of a SmartBuoy at Inner Dowsing and recovery of Guard Buoy at Newbiggin.

4. Opportunistic deployment of passive samplers for trace metal and organic contaminants.

REPORT

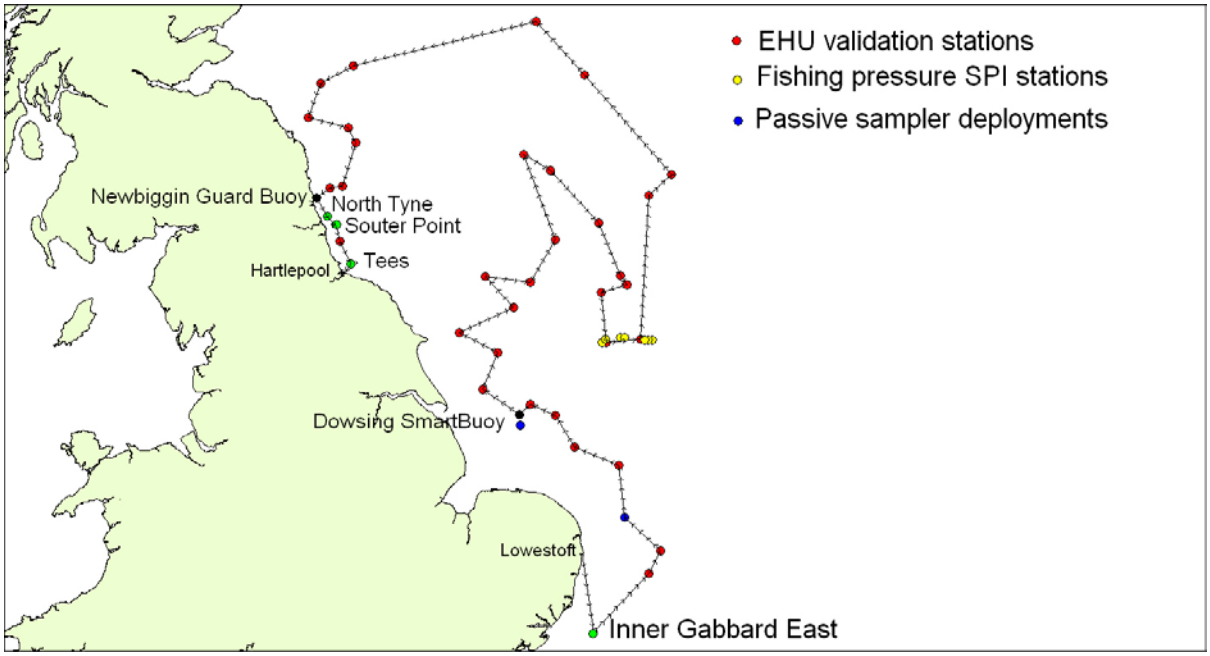

Figure 1. Map showing cruise track and surveys undertaken during CEND 11b/11.update

The cruise track for CEND 11b/11 is shown in Figure 1. The R.V. Endeavour left Lowestoft at 15:30 BST on Thursday 23rd June 2011 and sailed to a shakedown station off Sizewell arriving at 18:30 BST. Here the CTD rosette and Nioz core were deployed to make sure all were functioning properly and to give the crew and scientists practice on deployment, recovery and sample analyses. On completion, the ship steamed to the Inner Gabbard East dredged material disposal site (Aim 1) and started surveying at 22:42 BST. This site was surveyed to monitor whether the deposited material is staying within the confines of the licensed area. This was done using multibeam bathymetry with grabs taken for particle size analysis (PSA) to aid in ground-truthing the acoustic data.

On completion of the Inner Gabbard East survey the ship steamed north east to the first of the EHU validation stations (Figure 2, Aim 2a). Each of the EHU validation stations were sampled using sediment profile imagery (SPI,Figure 3), CTD rosette, Nioz core and 2 meter beam trawls to assess biogeochemical parameters and epifaunal size-spectra respectively. On transit between S2 and S3 the first of the opportunistic deployments of passive samplers was undertaken (Aim 4; Figure 4).

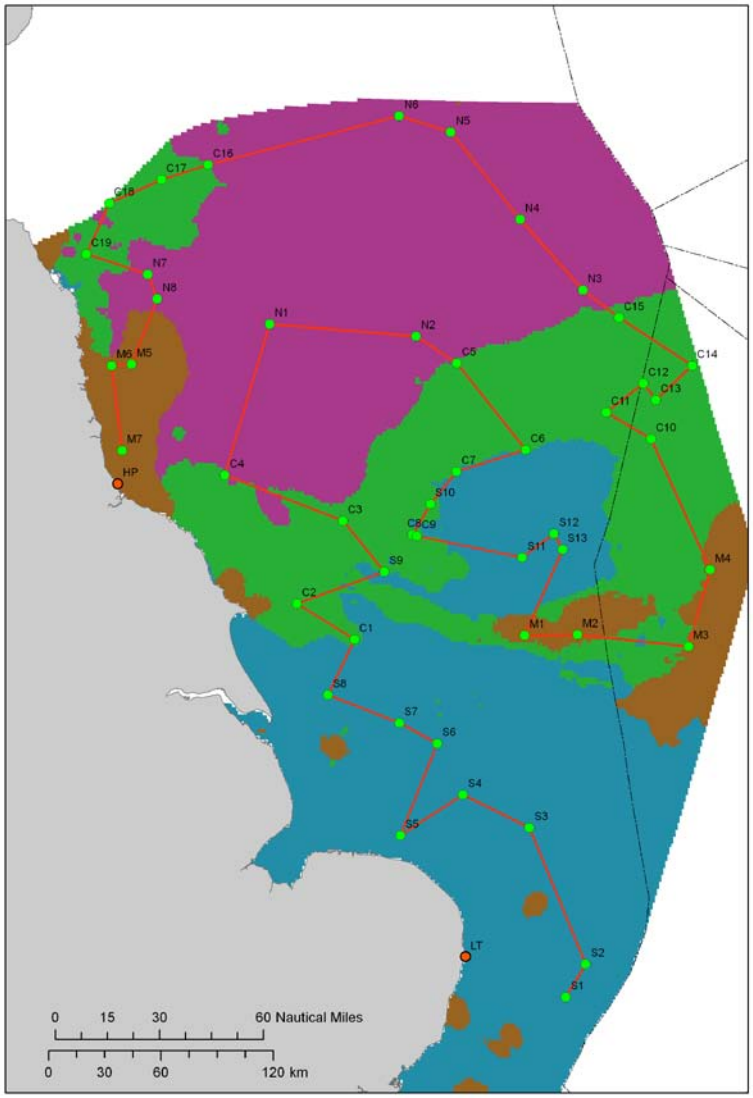

Figure 2. EHU validation stations within the four ecohydrodynamics. S – Southern, C – Central, N – Northern, M – Mud.

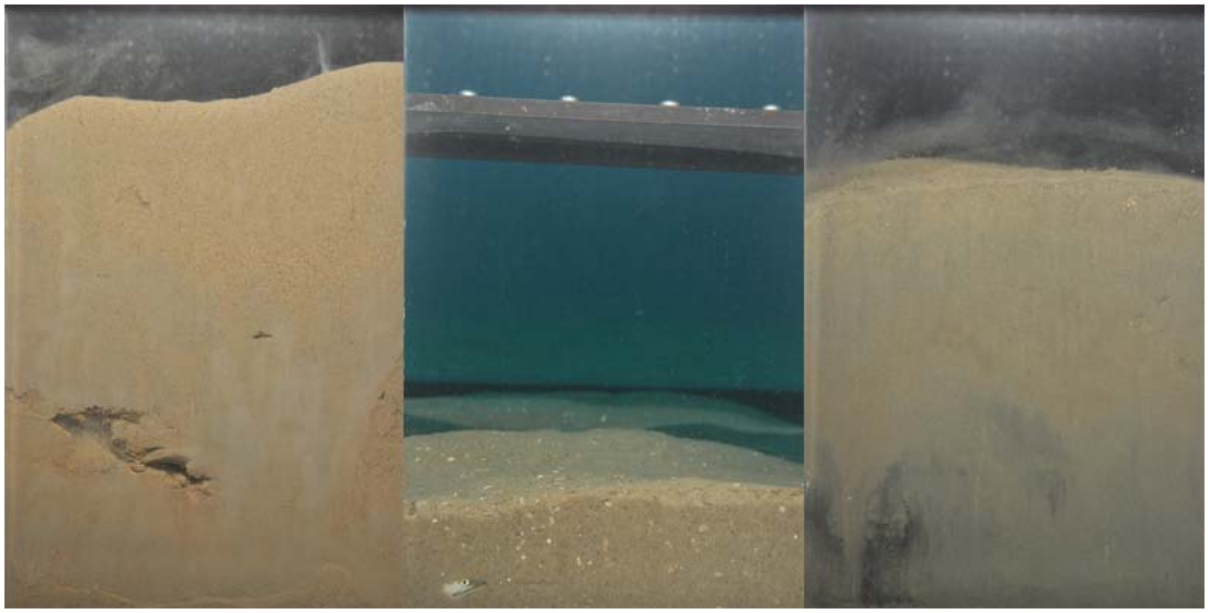

Figure 3. A selection of SPI images taken from EHU validation stations.

Figure 4. Passive sampler membranes being attached to a SmartBuoy before deployment.

The EHU survey was then continued until the Dowsing SmartBuoy deployment was reached (Aim 3). This station was also used to deploy the last of the passive samplers (Aim 4). The ship then continued along the EHU stations, picking up the SPI fishing transect between M1 and M2 (Aim 2b), finishing aim 2 at 20:00 BST on 1st July.

The ship then proceeded to the Souter Point dredged material disposal ground. This site was surveyed to monitor migration of cap material outside the original disposal footprint and to

check that cap integrity is maintained with no leakage of contaminated dredge material to the surrounding area. This was achieved using sidescan sonar, multibeam bathymetry to provide the data on the cap migration, sub-bottom profiler to check cap thickness, and Nioz cores, piston cores and day grabs to provide information on contaminant levels and benthos within and outside of the disposal ground.

On finishing, the Endeavour proceeded to the North Tyne dredged material disposal ground. This site was surveyed with grab samples to check that any elevations in the concentrations of chemical contaminants that are directly attributable to dredged material disposal will be confined to within and the near vicinity of the disposal site and within acceptable limits.

Following completion of the North Tyne survey the Endeavour proceeded to the Tees Inner and Outer dredged disposal sites. Theses site were both surveyed with grab samples to check that any elevations in the concentrations of chemical contaminants that are directly attributable to dredged material disposal will be confined to within and the near vicinity of the disposal site and within acceptable limits.

At the ed of this survey the ship docked at Hartlepool at 17:00 BST on 4th July , to change crew and equipment for CEND 11c/11.