

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE,
LOWESTOFT, SUFFOLK, ENGLAND

DRAFT 2007 RESEARCH VESSEL PROGRAMME

PROGRAMME: RV Endeavour: CRUISE 19/07

STAFF:

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DURATION: Friday 26th October – Friday 2nd November

Approx Sailing Time 21:00 BST (HW 21:25 GMT)

Approx Docking Time 1530 GMT on 2nd (HW 1552 GMT)

LOCALITY: Southern Bight, Oyster grounds and Central North Sea, Dogger Bank region

Background: This is the 5th cruise of a series of cruises that form an essential part of a project addressing the source, cycling and fate of nutrients (i.e. carbon, nitrogen, silicon, oxygen) in UK Shelf Seas, specifically the North Sea. It will examine the relative importance of the various ecosystem components, their degree of connectivity and their susceptibility to change due to environmental or human pressures. The project combines an intensive observational programme in the North Sea, with model development and operation. Three representative sites have been selected for detailed process studies (up to 5 cruises per year for 3 years) of pelagic (water column) and benthic (seabed) food webs, with horizontal and vertical spatial sampling over a broader area being achieved using a variety of towed instruments, and the temporal range being extended using autonomous buoys and bottom landers. *In situ* observations will be supplemented by satellite imagery and data from other sources, such as the continuous plankton recorder (CPR) and Ferryboxes™.

Overall aims of this series of cruises are to investigate:

1. Pelagic food webs, water column measurements
2. Hydrography and seawater chemistry
- 3 Community structure
- 4 Phytoplankton and microbial production
- 5 Grazing impacts
- 6 Mesozooplankton secondary production
- 7 Vertical flux and budgets of carbon
- 8 Benthic food webs, sediment processes, exchanges across the interface
- 9 Sediment Profile Imagery
- 10 Advection in coarse sediments
- 11 Resuspension events

Specific cruise AIMS (not in priority order)

1. Recover and redploy landers at the three sites and additionally the smart buoys at the north dogger site.
2. Perform scanfish tows to give the water column context.
3. Sampling at frequent intervals (approx hourly) using CTD rosette at the 3 sites with LISST
4. CTD casts for Primary productivity estimates and deck incubations using N15 uptake.
5. Underway measurements for isotopic ratio work from continuous supply.
6. Collect Plankton samples for species composition using vertical nets.
7. Deployment of SPI camera over a wide range of sites to characterize inter site variability
8. Undertake assessment of benthic flora/fauna assemblage using Jennings beam trawls
9. Collect samples for isotope analysis of fish, fauna and flora using 2m beam
10. Collect core profiles, of nutrients, oxygen, chl-a. (NIOZ corer) and sediment profiles.
11. Undertake experiments on productivity and grazing at the three sites.
12. Deploy the benthic sampler
13. Collect Plankton samples using the bio ness multi net.

Cruise Narrative

The Endeavour sailed on time at 20:30 and proceeded to the Gabbard mooring site. A CTD and full sample suite were taken with associated net hauls were successfully performed. On passage to the Sean gas field, surface samples were taken along with net hauls. On arrival at the gas field a SPI survey was undertaken and then contact was made with the lander. While the acoustic release responded the floats did not pop up. This was then successfully dragged for. Following this coring was undertaken, then the benthic sledge, bio ness undertaken and the cycle of CTDs were undertaken starting with the full sample CTD including nets. In increasing winds on Sunday morning the ring nets were unusable and the weather conditions unfit for the bioness multi net. After completion of the beam trawls inter linked with the CTD cycle at 14:00 the vessel departed for the oyster ground site via the Scanfish line. The scanfish line was completed over night (Sunday – Monday) without incident in 3m seas force 6- 7. With 2 samples taken for N15 isotope analysis on route. On arrival at the oyster grounds a benthic sledge followed by a 2m net was performed. The spi camera survey was performed and NIOZ coring undertaken. Just before lunch the bioness was successfully deployed. After lunch the lander was retrieved and another deployed, just before sunset the benthic sledge was deployed and the cycle of CTDs started continuing until 14:00 on Tuesday. With a productivity CTD at 0800. The beam trawls were performed between the CTD casts, On completion of the ctd cycle the scanfish lines north were commenced with recovery between the two lines. On Wednesday morning the scanfish line was successfully completed and on return to the Dogger Bank work area, a CTD for bottom water was under taken and NIOZ coring started. On completion of the NIOZ coring the mooring was contacted and triggered. The floats did not pop us as it was subsequently discovered that the lander had turned up side down on deployment. The smart buoy was recovered and a new buoy deployed, the lander was grappled at the first attempt and a new one deployed after a SPI camera survey. After this the cycle of CTDs was started unfortunately a 1m ring net (500 um) was lost when a wire parted. Bioness multi nets and benthic sledge were performed in the night between CTD and the 2m beams in the morning. Following lunch a sledge was deployed and

at 1600 the bioness recorded its first complete set of good samples. After the last CTD at 17:00 the ship sailed for Lowestoft to dock for the afternoon tide on the 2nd.

Results

All the cruise objectives were met, the moorings were retrieved and redployed, sites were sampled with all the instrumentation at the expected frequency. Onboard experiments were performed and 1st indications were that they were successful. The North Dogger site was thermally stratified by 4°C at 55m while the other two sites were physically well mixed.

A total of 59 CTD stations, 56 Nioz cores, 13 full samples CTDs of 18 different determinants, 3 lander moorings and one smart buoy, 36 nets, 5 bioness hauls, 6 hyperbenthic sledge tows, two 2m ring nets hauls and 15 2m beam hauls.

Acknowledgements

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