

**CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE,
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 0HT, UK**

2004 RESEARCH VESSEL PROGRAMME

REPORT: RV ENDEAVOUR: CRUISE 4/04

STAFF: Simon Jennings (SIC)
Tracy Dinmore (2IC)
Nick Dulvy
Chris Firmin
Craig Mills
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Karema Warr
Carolyn Barnes (University of Newcastle)
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DURATION: 7 April – 17 April

LOCALITY: North Sea (IVb and IVc)

AIMS:

The aims of this cruise were (1) to describe the impacts of trawling disturbance on the structure and productivity of benthic communities (2) to examine the effects of fishing on the trophic structure of fish communities and (3) to describe spatial variation in carbon, sulphur and nitrogen isotopes at the base of estuarine and marine food chains.

Specific objectives were:

1. To sample infaunal and epifaunal invertebrates at a series of sites subject to different levels of trawling disturbance.
2. To sample infaunal and epifaunal invertebrates and fish for food web studies.
3. To collect benthic invertebrate species for stable isotope analysis

NARRATIVE:

Endeavour sailed from Lowestoft at 10.54h on 7 April. She proceeded to a Hamon grabbing box on the Middle Rough (location 55° 44.0' N to 55° 45.0' N and 03° 00.0' E to 03° 01.6' E) where 10 Hamon grab sediment samples were taken from 5 sites. Work commenced at 09.45h on 8 April and was completed by 16.15h. Hamon grab samples from the Middle Rough and two other sites (Hills and Indefatigable) will be processed to provide information on the size and trophic structure of benthic communities in support of indicator development.

With the northerly swell subsiding, Endeavour sailed south overnight to a second Hamon grabbing box in the vicinity of the Hills (location 54° 26.0' N to 54° 27.0' N and 01° 07.0' E

to 01° 08.7' E). Hamon grabbing commenced at 06.00h on Friday 9 April and 10 Hamon grab samples were taken from 5 sites in the Hills box. Hamon grabbing was complete at 11.30h and Endeavour sailed south to the first of 27 Hamon grab and 2-m beam stations in the southern North Sea and Thames Estuary. These stations were sampled to provide information on the spatial distribution of carbon, nitrogen and sulphur stable isotopes in infaunal bivalves and epifaunal predators. Sampling on the 27 grid station began at 04.40h on Saturday 10 April and continued until the final station was complete at 16.50h on Monday 12 April. Work stopped for 2 hours from 03.30h to 05.30h on Sunday 11 April while a hydraulic leak was repaired and new hydraulic oil added to the system.

From the final station in the southern North Sea and Thames Estuary grid, Endeavour sailed north-east to the Indefatigable Banks, and arrived on station at 06.00h on Tuesday 13 April. Ten Hamon grab sediment samples were taken from 5 sites in a box from 53° 48.0' N to 53° 49.0' N and 02° 07.0' E to 02° 08.7' E, followed by 2-m and 4-m beam trawl samples of fish and invertebrates on a trawl line adjacent to the box. Work was completed at 14.00h on Tuesday 13 April, and Endeavour steamed north to the north-west Rough to commence 2-m and 4-m beam trawl sampling for fish and invertebrates. Work on the north-west Rough began at 06.00h on Wednesday 14 April and was complete by 08.30h. Endeavour then steamed south-west to conduct 2-m and 4-m beam trawl sampling on the Barmade Bank. This work began at 11.30h and was completed by 14.45h.

From Barmade Bank, Endeavour steamed approximately 20 miles north-west and from 17.15h until 22.50h, infaunal and epifaunal invertebrates were sampled at two sites for stable isotope analysis with the Hamon grab and 2-m beam trawl. Following the completion of this work, Endeavour steamed north to a beam trawl station close to Devils Hole. She arrived on station at 04.20h on Thursday 15 April and work was completed at 06.20h. From Devils Hole, Endeavour steamed south to the Hills area and started testing the performance of the 2-m beam trawl in two boxes where replicate tows were randomised by towing time and towing speed. Work began at 17.15h on Thursday 15 April, following a muster drill at 16.15h. Beam trawl testing was completed by 16.35h on Friday 16 April.

With the cruise objectives met in full, Endeavour sailed for Lowestoft. She docked in Lowestoft at 08.30h on Saturday 17 April.

The following progress was made in relation to the specific objectives:

1. To sample infaunal and epifaunal invertebrates at a series of sites subject to different levels of trawling disturbance.

Completed in full

2. To sample infaunal and epifaunal invertebrates and fish for food web studies.

Completed in full

3. To collect benthic invertebrate species for stable isotope analysis

Completed in full

In addition to the specified work, we further tested the Hipap system on the 2-m beam trawl and assessed the performance of this trawl in relation to towing time and towing speed at two depths.

This was a productive cruise and the weather was excellent throughout. All the main objectives were met in full and some additional work was completed. The cruise provided more evidence that Endeavour is an ideal platform for conducting the sampling that supports the 'impacts of fishing' programme.

Several of the stations in the southern North Sea and Thames Estuary grid were close to, or within, shipping lanes. The ship's officers spent significant additional time on the bridge to ensure that these stations could be sampled quickly and safely despite the presence of shipping traffic, and the scientists are very grateful for their efforts that contributed to the success of this cruise.

Tracy Dinmore (2IC) took the role of SIC on 13 and 14 April and the work for which she was responsible progressed rapidly and according to plan.

ADDITIONAL WORK COMPLETED:

1. Water samples collected from ship's 'clean' seawater supply over a 10 hour period to assess levels of contamination (Bryn Jones)
2. Dabs and whiting collected and frozen for calorimetry (Steph Cogan)
3. Sole and whiting otoliths collected for strontium-calcium and stable isotope analysis (Chris Leakey)
4. Berried female crab collected and frozen for genetic analysis (Derek Eaton)
5. Acoustic data were logged electronically from 9-13 April using the multibeam. These data will be used to examine the pitch, heave and rolling properties of the ship (Bill Meadows)
6. Swimming crabs (*L. holsatus*) collected for feeding rays (Jim Ellis)



Simon Jennings
Scientist in Charge
17 April 2004


SEEN IN DRAFT: A. Reading (Master)



A. Lincoln (SFM)



INITIALLED: E.C.E. Potter (FB SAH)



DISTRIBUTION:

Basic List +
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Karema Warr
Carolyn Barnes (University of Newcastle)
Chris Leakey (University of Plymouth)
SIGS
Fishing skipper: Endeavour
Eastern SFC
North Eastern SFC