MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1994 RESEARCH VESSEL PROGRAMME

REPORT: RV *CORYSTES*: CRUISE 5

STAFF:

H L Rees (SIC)
D Limpenny
P Hudson
M Pendle
A Kenny
S Hull
I Napier (from 11 May)

DURATION:

4-17 May

LOCALITY:

North Sea

AIMS:

1. To sample a grid of stations on the Dogger Bank for a range of contaminants in sediments and benthos.

2. To sample remaining NMP stations in the North Sea for sediments and benthos.

3. To conduct further sampling at an experimentally dredged area off the Norfolk coast, using grab, dredge, side-scan sonar and underwater camera.

4. To obtain samples of fish (for stomach content analysis) and benthos at and near to aggregate dredging activity off the Humber.

5. To sample the sediments and benthos at the Tyne sewage-sludge disposal site using grab and beam trawl.

6. To sample Horse mussels from the Humber/Wash area for later analyses of contaminants in flesh.

7. To sample the sediments and benthos at Race Bank (a proposed sand extraction area in the Wash).

ADDITIONS:

1. To sample the sediments and benthos at the Docking Shoal (a proposed sand extraction area in the Wash).

2. To collect information for D Bennett (FSM3) on any edible crabs caught during the cruise.

NARRATIVE:

A simplified cruise track is given in Figure 1.

On 5 May, 5 Hamon grab samples were collected for the benthos at a site off Norfolk which had been experimentally dredged by a commercial dredger in April 1992. A further 10 samples were collected at nearby reference sites. Following a side-scan sonar survey at the 'Treatment' site, *Corystes* sailed to the northern edge of the Dogger Bank, via NMP 345 which was sampled by Day grab for sediments and benthos. Grab and trawl sampling on a grid of stations continued uninterrupted until the morning of 10 May, with sub-samples being retained for later analyses of contaminants in sediments and biota. Sampling at NMP 285 was then completed, followed by NMP 245 off the Tyne. Day grabs for benthos and sediments were collected at an annually sampled site south of the Tyne sewage-sludge disposal site, followed (overnight) by sampling on a grid of 27 stations around the disposal site itself, where sediment sub-samples were taken for later analyses of trace metal concentrations (also part of an ongoing study).

On the morning of 11 May, Dr Napier joined the ship at North Shields. Samples of the benthos and sediments were then collected at two annually sampled stations at and to the north of the Tyne sewage-sludge disposal site. Three 2-metre beam trawl tows for the epibenthos and litter were also taken at the disposal site. A further 27 grab samples for later analyses of trace metal concentrations in sediments were collected at an offshore reference box. *Corystes* then sailed to re-commence sampling on the Dogger Bank grid, via NMP 295 (off the Tees). Work continued until the evening of 13 May, when *Corystes* sailed to the Humber area.

Horse mussels for later contaminant analyses were collected at three annually sampled sites in the vicinity of the Humber sewage-sludge disposal site on the morning of 14 May. Stony ground at NMP 375 was then successfully worked by Shipek grab. A 3-metre beam trawl was deployed at and adjacent to a gravel extraction area south of the Humber. Samples of fish stomachs were retained for later laboratory analyses. 5 Hamon grab samples of the benthos were subsequently collected along each tow line.

A further sample of Horse mussels was collected in the 'Inner Dowsing' area on the morning of 15 May, followed by a side-scan sonar survey at Race Bank (a proposed sand extraction area). After NMP 385 in the inner Wash was sampled by Shipek grab (on account of stony ground), *Corystes* returned to the Race Bank where 9 stations were sampled for the benthos; 3 of the stations were also sampled by a 2-metre beam trawl.

On 16 May, 4 stations in the vicinity of the Docking Shoal (another proposed sand extraction area) were sampled by Day grab for the benthos; 2-metre beam trawl tows for the epibenthos were also made across two of these stations. A site off the Norfolk coast was visited for collection of Horse mussels, and the ship then returned to the experimentally dredged site nearby. Following collection of a Hamon grab sample, a frame-mounted low-light intensity camera was deployed across the area. On completion, *Corystes* sailed for Lowestoft, docking at 01.00 hr on 17 May.

RESULTS:

Aims 2 to 7 were successfully completed, along with two additions. 176 (of 212) stations were sampled on the Dogger Bank (aim 1). It is intended that the remaining samples will be collected on *Cirolana* 8/94 in July. Samples of benthic organisms for later analyses of contaminant content were collected at several Day grab and beam trawl stations on the grid. Samples for reference purposes were also retained from trawl samples collected during the pursuit of other cruise aims.

As expected, the coarse ground at NMP 375 and 385 (Humber/Wash) was unsuitable for benthos sampling by Day grab. Consequently, reliance will be placed on samples previously collected at alternative locations. Sampling of sediments by Shipek grab for later analyses of contaminant concentrations was, however, successful. A second attempt to sample dabs at NMP 245 (off the Tyne) was unsuccessful.

A side-scan sonar survey at the experimentally dredged plot off Norfolk showed that the dredge tracks could still be delineated some two years after dredging. However, they are no longer sharply defined, as a result of weathering. The sonar record reflects textural changes along infilled tracks, as camera work has shown the sea bed to present a relatively smooth profile, in contrast to the undulations evident soon after dredging.

Good images of the sea bed were obtained from the low-light intensity (black and white) video camera deployed at the experimentally dredged site off Norfolk. Although the ability to identify benthic epifaunal species is limited by the lack of colour, the camera may permit a wider field of view and hence may be particularly useful in identifying physical features of the sea bed.

Samples of fish stomachs from a range of species in the vicinity of a gravel extraction area in the Humber will be examined in the laboratory with reference to the benthic organisms sampled by Hamon grab in the same area.

Trawl samples at the Tyne sewage-sludge disposal site were again characterised by appreciable quantities of sewage debris at the sea bed. (A decline in quantity was anticipated in response to the recent installation of finer-meshed screening facilities prior to sea disposal).

As at other sampling areas, full results for surveys at Race Bank and the Docking Shoal must await the outcome of laboratory analysis. However, it was clear that the clean sandy sediments supported a very sparse benthic infauna, indicating mobility under the influence of strong tidal currents and wave action. Beam trawls also revealed a relatively sparse epifauna.

Observations were made on a small number of edible crabs caught by trawl and dredge in the Humber/Wash area, for D Bennett (FSM3); no berried crabs were encountered.

H L Rees
20 May 1994

SEEN IN DRAFT: M J WILLCOCK (Master)
R F GRAHAM (Senior Fishing Mate)

INITIALLED: JEP

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Figure 1.

Corystes 5/94 : simplified cruise track