

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

1993 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 12b

STAFF:

H L Rees (SIC)
I R Napier
D S Limpenny
M A Pendle
P M Hudson
A J Kenny

DURATION:

Left Lowestoft 1900h, 25 November
Arrived Lowestoft 0130h, 7 December
All times are Greenwich Mean Time

LOCALITY:

North Sea/English Channel

AIMS:

1. To conduct a survey of an experimentally-dredged site off Norfolk, using grab, underwater camera and side-scan sonar.
2. To conduct trials with a Hamon grab using different bucket sizes.
3. To sample the sediments, benthos and fish (dab or flounder) at various North Sea NMP sites, using grab and trawl.
4. To sample a grid of stations on the Dogger Bank for a range of contaminants in sediments and benthos.
5. To deploy a Kasten core at the Silver Pit and at other suitable muddy locations.
6. To conduct a side-scan sonar and benthos survey at an aggregate extraction site off Hastings.
7. To sample horse-mussels from the Humber/Wash area for biological and chemical analysis.
8. To conduct a bathymetric survey at a solid waste disposal site off the River Tyne, NE England.

ADDITIONS:

1. To initiate sampling at and around aggregate dredging areas for analysis of fish gut contents.
2. To sample sediments off the Tyne as part of a temporal study of contaminant concentrations.
3. To sample the outer Thames estuary by beam trawl for litter content and benthos.

NARRATIVE:

A simplified cruise track is shown in Figure 1. On 25 November, RV Corystes sailed via the Roxann calibration box to a site off North Norfolk, which was experimentally dredged in April, 1992 (aim 1). A side-scan sonar survey was postponed due to failure of the main cable winch. Following a bathymetric survey of the dredged plot, 5 Hamon grabs were taken there. The underwater camera sledge was also deployed across the dredged site. A further 5 Hamon grabs were taken at a nearby reference site followed by 5 with the use of a smaller-sized bucket.

On 27 November, the contents of a 4 m beam trawl tow in the vicinity were processed for fish stomachs (additional aim 1). Scallop dredge tows were made across the dredged site and reference site, and samples were processed while sailing to Yarmouth to transfer a crewman to shore. Following an overnight steam, a 4 m beam trawl tow was made at NMP 34 (aim 3). Grab sampling was abandoned due to deteriorating weather, and Corystes sailed NW to a location off Tees Bay. No sampling was possible on 29 November, due to bad weather. The following day, a 4 m beam trawl tow along with Day grab sampling was carried out at NMP 29 (aim 3), followed by 2m beam trawl tows at inshore sites off the Tees and Tyne. A bathymetric survey was then carried out at a solid waste disposal site (aim 8), followed by 27 Day grab samples off the Tyne (additional aim 2).

On the morning of 1 December, a 4m beam trawl and Day grab samples were collected at NMP 24 (aim 3). Weather conditions were unsuitable for offshore work (aim 4) and Corystes sailed to the Humber area, where 2 samples of horse-mussels were obtained using a Rock dredge (aim 7). On 2 December, 4 m and 2 m beam trawl samples were obtained at NMP 37. A grid of stations near to this site was worked in an attempt to locate soft substrates. This was followed by a 4m beam trawl tow at an aggregate dredging site south of the Humber (additional aim 1) and a Rock dredge in the Inner Dowsing area (aim 7). Corystes then returned to the Norfolk experimental site for a side-scan survey to complete aim 1. Weather conditions remained unsuitable for the Dogger Bank (aim 4) and Corystes sailed via the Cross Sand area (for two 4 m beam trawl tows : additional aim 1) to the Thames, arriving on 3 December. A 4 m beam trawl sample was taken in the East Swin, seaward of NMP 46 (aim 3), followed by a series of 2m beam trawl tows in the outer Thames area for litter content and benthos (additional aim 3).

After sheltering overnight from strong SW winds, Corystes sailed to Hastings, commencing work with two 4 m beam trawl tows at and to the north of the aggregate dredging area (additional aim 1). 3 scallop dredge tows were made in the vicinity of the dredged site, followed by 6 Day grab stations for sediments (aim 6). On 5 December, the underwater TV sledge was deployed, followed by a side-scan sonar survey at the southern edge of the dredged site (aim 6). 8 benthos samples were taken using a Hamon grab, and Corystes then sailed overnight for NMP 47, where 4m and 2m beam trawls were deployed, along with Day grabs for benthos and sediments (aim 3). Corystes then sailed for Lowestoft, docking at 0130h on 7 December.

RESULTS:

Aims 1, 2 and 6-8 were successfully achieved, along with 3 additions. Full results await completion of laboratory analysis. Sampling for aim 3 (NMP grabs and trawls) was successful at 7 of 11 sites, although only 1 yielded an adequate quantity of dabs for contaminant analysis. Systematic grab sampling around NMP 37 confirmed the absence of suitable soft substrates in the general vicinity. The location of NMP 46a (Thames) is more suited to sampling from a small vessel. Adverse weather prevented work in connection with aims 4 and 5. These, along with further NMP sampling, will be pursued during 1994.

Sediments sampled by Day grab at the Roxann calibration box were similar to those found on previous cruises (ie clean sand with small amounts of fine gravel); however, this was 'undefined' using the current Roxann sediment descriptions.

Although dredge tracks are no longer clearly defined, effects of experimental dredging in April, 1992 off Norfolk were clearly evident in the results from Roxann and side-scan sonar, which showed textural differences in substrate type compared with the surrounding area. Trials with a smaller bucket size fitted to the Hamon grab were successful; a comparison of the effectiveness of the two sizes in terms of quantification of benthic organisms awaits results from laboratory analysis.

A bathymetric survey at a disposal site off the River Tyne (where large quantities of minestone and tailings have been disposed of in recent years) confirmed shallowing of up to 5m; however, this was confined to parts of the disposal site itself (see Figure 2). The natural water depth in this area is about 45m. Roxann images also helped to discriminate minewaste from the prevailing natural sandy substrates, and provided no evidence of 'short dumping'.

Litter content was minimal in trawl samples at the seaward ends of the Barrow, Black and Knock Deepes (outer Thames estuary), although some debris arising from the nearby sewage-sludge disposal site was evident at the first location.

Against expectation, a moderate catch of fish (including some large plaice) was obtained in a trawl tow across the Hastings dredging area. Day and Hamon grab sampling provided no evidence of significant accumulations of fine sediment in the general vicinity, which might be associated with dredging activity. Clear evidence of 'out-of-area' dredging (extending at least 500m to the south of the licensed area) was obtained from side-scan sonar images. Deck processing of scallop dredge samples revealed a marked reduction in the densities and variety of benthic organisms at the dredging site, although there was no evidence of significant effects arising from 'out-of-area' dredging at a station to the south. (Numbers of taxa at the dredged site, and at locations to the south and west were, respectively, 12, 31 and 28).

H L Rees
7 December 1993

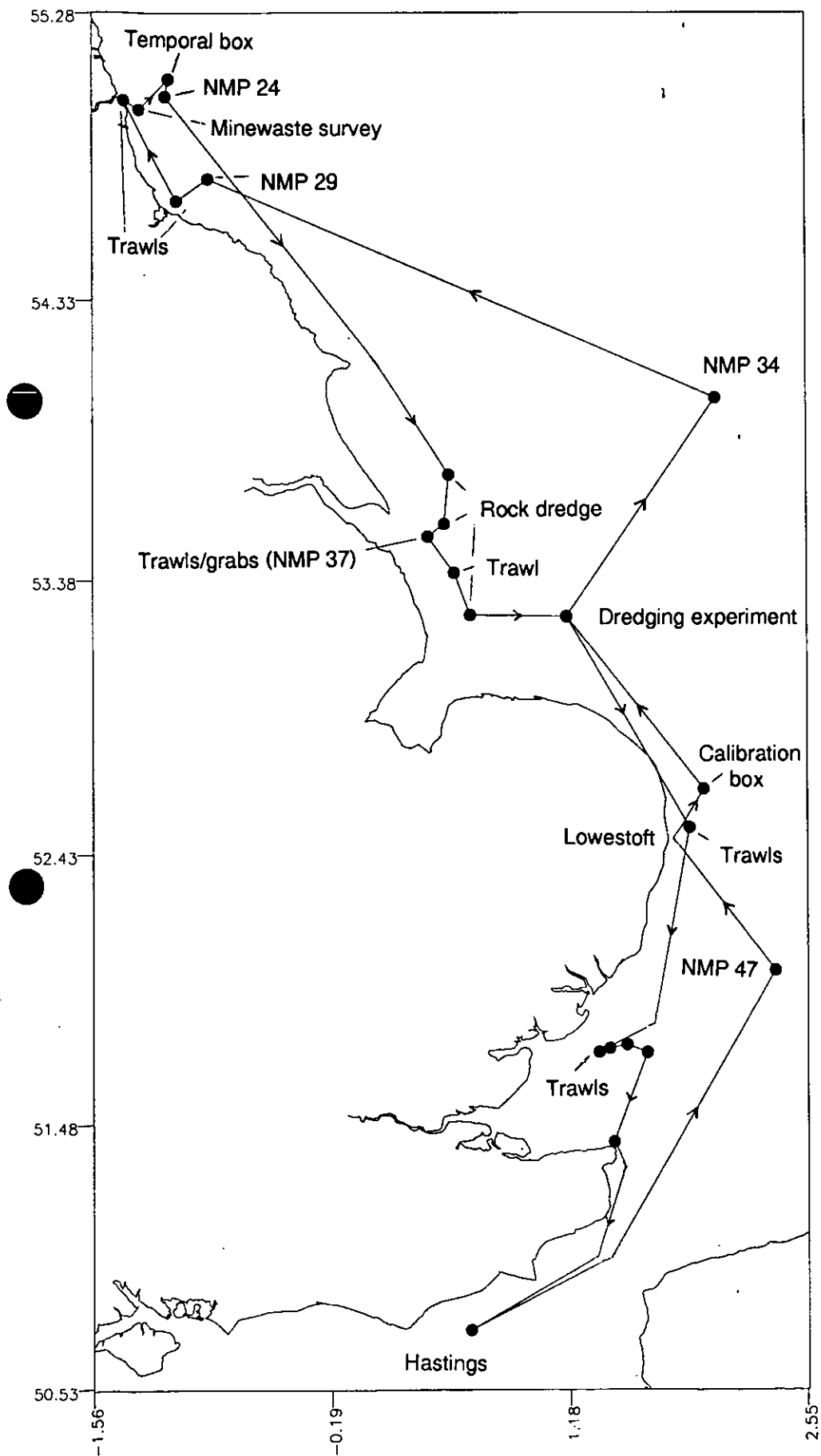
SEEN IN DRAFT: M J Willcock (Master)
R F Graham (Senior Fishing Mate)

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FIGURE 1. CRUISE TRACK



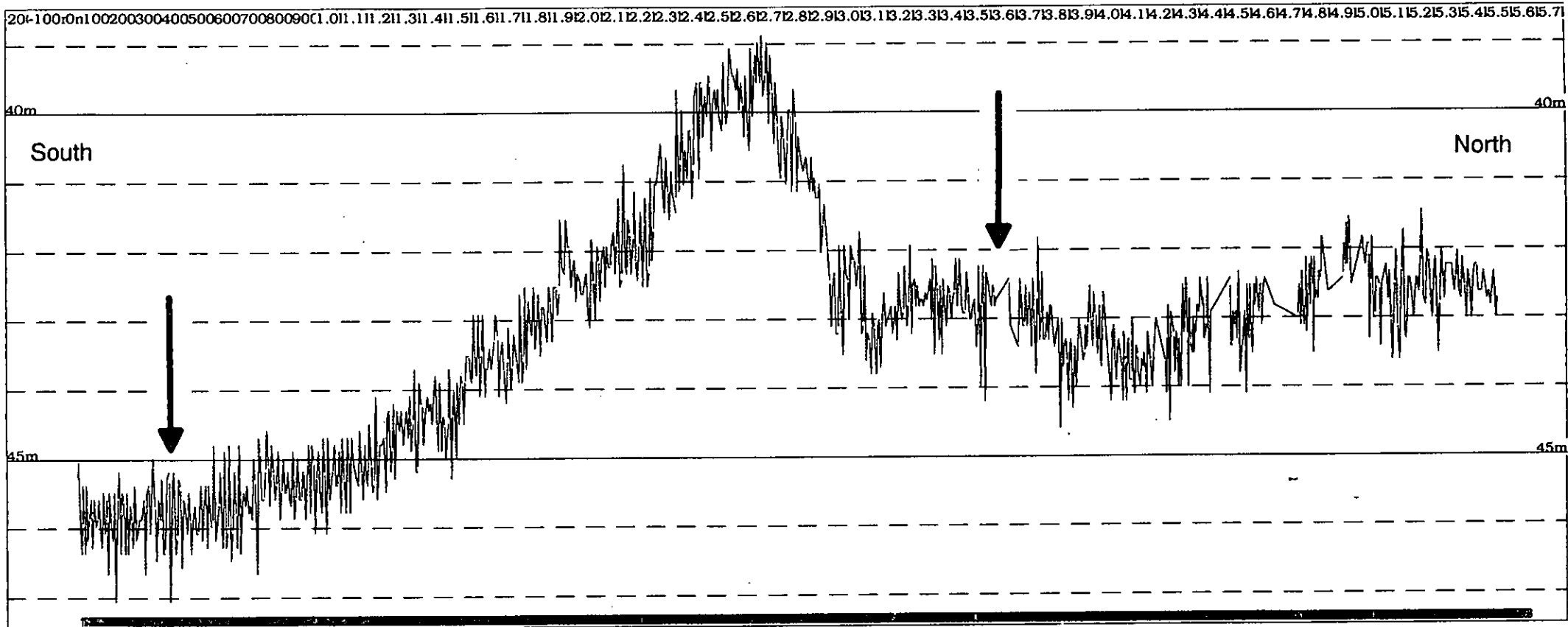


Figure 2. Depth profile across a solid waste disposal site off the NE coast of England. Water depths decrease naturally from south to north. Arrows indicate the approximate boundaries of the disposal site, within which shallowing due largely to minewaste disposal can be identified.