

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

1993 RESEARCH VESSEL PROGRAMME

REPORT : RV CIROLANA : CRUISE 6

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DURATION :

Left Lowestoft 1300h 9 June
Arrived Lowestoft 0630h 1 July

(All times are Greenwich Mean Time)

LOCATION : North Sea, English Channel, Irish Sea.

- AIMS :**
1. To conduct monitoring studies at stations established under the UK National Monitoring Programme (NMP). This will involve physical measurements, and the collection of samples for chemical analysis and biological effects studies.
 2. To collect water and sediment samples for analysis of PAH in coastal and estuarine waters.
 3. To collect water samples for the analysis of volatile organic compounds in coastal and estuarine waters.
 4. To collect water samples along a transect through the English Channel for Lindane (γ -HCH) analysis, following the loss of MV PERINTIS in March 1989.
 5. To recover a multi-instrumented mooring laid in the western Irish Sea (approximate position 54° N 5° 40' W) in May 1993.

PLAN :

CIROLANA sailed at 1300h in bright, clear weather, and made for the River Tweed, where sampling began on 10 June, both from the ship and from the ships Searider, under Aims 1 to 3. The River Blyth was sampled on 11 June, but on 12 June the sea was too rough for deployment of

the Searider. With a poor forecast for the next few days, CIROLANA left the Tyne anchor position and during the 12 & 13 June worked the offshore stations in the North Sea. On returning to the Tyne on 14 June the weather was again fair and sampling resumed as before. The stations in the Wear were sampled on 14 June, and those in the Tees on 15 June. Whilst anchored off the Tees samples collected by a shore party were also transferred to the ship for testing by means of the Searider. CIROLANA then steamed southwards, samples being collected off the Humber and Wash on the same day, and by Smith's Knoll, the Outer Gabbard and the Warp (outer Thames) on 16 June. Sampling in the English Channel began on 17 June under Aims 1 to 4, with boat stations in Poole Harbour and the Tamar being worked on 17 and 18 June respectively. Further samples collected by the shore party were collected from the Town Quay, Poole. On leaving Plymouth Sound CIROLANA proceeded to the reference station on the Little Sole Bank (Western Approaches), where samples were collected on 19 June in calm, bright weather. On 20 June samples were collected in the Celtic Deep and the Bristol Channel (off Nash Point), and in Cardigan Bay on 21 June en route to the Irish Sea. Samples were taken in the Mersey on 22 June, but sampling was unsuccessful in the Ribble as the weather was too rough for the Searider to operate satisfactorily. On 23 June samples were taken from a site at the mouth of the River Dee, and then CIROLANA proceeded to Holyhead to exchange crew members. A further station was worked on leaving Holyhead en route to Morecambe Bay, where anchor and boat stations were worked on 24 June. The River Ribble was also sampled successfully in the afternoon, after which the offshore stations towards the Isle of Man were worked. CIROLANA continued to the west, arriving off Dundalk Bay in the morning of 25 June. Work on the instrument mooring was conducted in calm, bright weather (Aim 5) and CIROLANA then proceeded northwards to the North Sea in steadily worsening weather, samples being collected from the Solway Firth, Firth of Clyde, Minches, Moray Firth and off the River Tay whilst on passage. Once through the Moray Firth the weather was again good, and three of the estuaries visited during the earlier part of the cruise were re-sampled in order to assess the variability of our data: the Tweed on 28 June, Blyth and the Tees on 29 June; and finally the Tees again in the early morning of 30 June. With sampling completed by 0700h, CIROLANA then made for Lowestoft, docking at 0630h on 1 July.

RESULTS :

In total 102 stations were worked during the cruise.

Aim 1. All sampling was carried out as planned. CTD profiles were taken at all offshore NMP sites; and from the ship at anchor during estuarine work. Salinity and nutrient samples were also taken for subsequent analysis.

Water samples and sediment elutriates were tested at sea using the oyster embryo bioassay: provisional results indicate that water quality was satisfactory at all sites, but one sediment from the River Tees (Redcar Jetty - NMP site 32) was very toxic, and slight toxicity was observed in a sediment from the River Wear. A number of other bioassays (whole sediment bioassays with *Arenicola marina* and *Corophium volutator*; sediment elutriate bioassays with *Littorina* and *Tisbe*; and an algal growth bioassay) were also run at sea and ashore, and the results will be assessed later. An improved solvent extraction technique was used to concentrate contaminants from water at NMP sites prior to testing with the *Tisbe* bioassay. Provisional results indicate that concentrations ranged from 1,000x below the toxicity threshold at some offshore sites (eg, Selsey Bill - NMP site 49) to 25-50x below in some estuaries.

Sediments and extracts of water for chemical analysis were stored in a freezer.

Aim 2. Samples for PAH analysis were collected from 75 stations. Water samples were analysed for total hydrocarbons by means of fluorescence spectrometry during the cruise -

concentrations ranged from $< 0.2 \mu\text{g l}^{-1}$ in offshore waters to $120 \mu\text{g l}^{-1}$ in the River Tees at Redcar Jetty. Analyses for specific PAH will be conducted in the laboratory.

Aim 3. Samples were collected from 67 stations; GC/MS analysis will be carried out in the laboratory.

Aim 4. Samples were collected from 13 stations along a transect from the Dover Strait to the Little Sole Bank.

Aim 5. One instrument mooring was recovered successfully and a thermistor chain removed from a second in calm, bright weather. All instruments recovered appeared to be in good order.

Robin Law
1 July 1993

SEEN IN DRAFT :

INITIALLED : PGS

DISTRIBUTION :

Basic list + RJ Law
CR Allchin
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Vanessa Dawes
DA Sheahan
PM Hudson
Moira Salmons
AD Fagg
Sorrel Bifield
MF Kirby
JE Portmann
A Franklin
JM Davies (SOAFD)
PC Reid (DoE)

RV CIROLANA : Cruise 6 / 93
9 June to 1 July 1993

