

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

1992 RESEARCH VESSEL PROGRAMME

REPORT : RV CIROLANA : CRUISE 7

STAFF :

R J Law	(SIC)
W McMinn	
R Rycroft	(25 - 29 June)
J E Thain	(25 June - 13 July)
C R Allchin	(25 June - 13 July)
Carole Kelly	(25 June - 13 July)
Ruth Hamer	(25 June - 13 July)
Rebekah Laslett	(25 June - 13 July)
Moira Salmons	(25 June - 13 July)
P R King	(25 June - 13 July)
Sorrel Bifield	(29 June - 13 July)
M F Kirby	(13 - 20 July)
M Blackburn	(13 - 20 July)
Vanessa Dawes	(13 - 20 July)
Julia Osborne	(13 - 20 July)

DURATION :

Left Lowestoft 1510h 25 June.
Arrived Lowestoft 0030h 20 July.
[All times are Greenwich Mean Time]

LOCATION :

North Sea, German Bight, English Channel, Irish Sea.

AIMS :

1. To conduct monitoring studies at stations established under the UK National Monitoring Programme. This will involve physical measurements, and the collection of samples for chemical analysis and biological effects studies.
2. To collect water samples for the analysis of volatile organic compounds in coastal and estuarine waters, in order both to quantify Red List compounds and to intercompare purge and trap and liquid-liquid extraction methods.
3. To collect water and sediment samples for analysis of PAH in coastal and estuarine waters.

4. To deploy a solid-phase extraction system to obtain samples for the analysis of dissolved organics in coastal and estuarine waters, both to support biological effects studies and to intercompare with liquid-liquid extraction procedures.
5. To collect samples of suspended particulate material, water and sediment samples in coastal and estuarine areas for analysis of organochlorine contaminants.
6. To collect water samples in inner estuarine areas for GC/MS screening of novel organic contaminants.
7. To collect water samples in coastal areas and areas of shipping activity for the analysis of organotin compounds.
8. To conduct a survey of cadmium in seawater along a transect from the Humber to the Dogger Bank, and then to the River Tees. This is a more detailed study intended to provide information on possible sources of cadmium in the area as indicated by relatively high concentrations in fish sampled during the 1991 NSTF studies.
9. To collect samples along established pollution gradients in the German Bight for use in the development and evaluation of whole sediment bioassay techniques.
10. To collect sediments for use in the preparation of reference materials for the National Marine Analytical Quality Control Programme recently established under the UK's National Monitoring Programme.
11. To collect samples of surface sediment from the vicinity of the Rame Head dredged spoil disposal area for analysis of organochlorines.

[Aims 10 & 11 were additional aims not on the original cruise programme.]

NARRATIVE :

CIROLANA sailed at 1510h on 25 June in good weather and made for the River Humber, where sampling began at 0650h on 26 June from both ship and Searider (principally towards Aim 1). On leaving the Humber samples were collected along a transect across the Dogger Bank (Aim 8), before sampling was undertaken in the estuaries of the Rivers Tees, Wear, Tyne and Tweed on 28 to 30 June. Whilst in the Tyne, Mr. Rycroft went ashore and Miss Bifield came aboard. Further sampling was undertaken on the northern and eastern edges of the Dogger Bank en route to the German Bight (Aim 8), where samples of surface sediment were collected on 1 - 3 July (Aim 9). After sampling in the outer Wash, CIROLANA then proceeded via the outer Thames through the English Channel, Western Approaches, Bristol Channel and Cardigan Bay to the Irish Sea. Samples of surface sediment were collected west of the Isle of Man for the JMG sediment baseline programme en route to the Solway Firth. Further inshore sampling was undertaken in Morecambe Bay, the Ribble and the Mersey on 10 & 11 July, but westerly winds of Force 6 to 7 prevented use of the Searider in the area of the mouth of the River Dee and the Burbo Flats on 12 July as planned. CIROLANA docked in Liverpool on 13 - 14 July to exchange scientists for the latter part of the cruise, moving into the lock at 0815h on 13 July and leaving at 0930h on 14 July. The anchor station in Liverpool Bay was re-occupied at 1100h that day and further sampling from the Searider was conducted in the River Mersey and the River Dee / Burbo Flats area in the afternoon and

evening, after which CIROLANA left Liverpool Bay bound for Plymouth. En route water samples were collected off the Lleyn Peninsula and by the Wolf Rock on 15 July, and sediments were taken from 14 stations around the Rame Head dredged spoil disposal ground between 0440h and 0804h on the morning of 16 July (Aim 11), prior to anchoring in Plymouth Sound. Sampling in the Tamar was undertaken that afternoon using the Searider, after which CIROLANA proceeded in wet and foggy weather to anchor off Poole Harbour, where further inshore sampling was conducted on 17 July, and then to the Solent and Southampton Water where the final inshore samples were collected on 18 July. CIROLANA then proceeded to Lowestoft in calm, fair weather, docking at 0030h on 20 July.

RESULTS :

All aims on the programme were completed successfully, a total of 154 stations being worked.

Aim 1. Sampling was conducted at 65 stations at offshore, coastal and estuarine sites. For the first time, two whole-sediment bioassays were conducted at sea, utilising *Arenicola* and *Corophium*. Results from the *Corophium* bioassays have still to be evaluated, but preliminary results indicate that sediments from some estuarine sites (eg, Tees & Tyne) were toxic to *Arenicola*.

Water column samples and sediment elutriates were bioassayed on-board using *Tetraselmis*. Enhanced growth was measured in the upper estuarine samples from the Humber, Tees, Tyne and Wear. Further replicate samples and elutriates were refrigerated, and will be tested using the oyster embryo bioassay in the laboratory.

Aim 2. Water samples were collected from 22 stations and retained for analysis by purge & trap GC/MS.

Aim 3. Water samples were collected from 3 stations and the extracts stored, sediments suitable for PAH analysis were collected from the majority of stations occupied.

Aim 4. Large volume water samples were collected from 10 stations and extracts prepared from these were tested using a *Tisbe* copepodid bioassay on-board. Preliminary results indicated that extracts from both contaminated and uncontaminated areas (such as the River Mersey and the western Channel off Land's End respectively) were toxic to the test species. Extracts obtained oth by solid-phase and liquid extraction were retained for analysis onshore.

Aim 5. Samples of suspended particulate material were collected from 4 estuarine stations for chlorobiphenyl (CB) analysis, and in addition water samples for CB analysis were taken from 8 stations. Water samples were collected from 88 stations for analysis of s-triazine herbicides (atrazine & simazine), and from 97 stations for analysis of hexachlorocyclohexanes (including lindane). This latter sampling included a 15 station transect along the English Channel from Brighton to Land's End as part of the continuing monitoring undertaken following the loss of MV PERINTIS south-east of Brixham in 1989.

Aim 6. Samples were collected from 25 stations and extracts retained for analysis onshore.

- Aim 7.** Water samples were collected for tributyltin analysis from 50 stations, including coastal and estuarine areas, and areas of shipping activity offshore.
- Aim 8.** Samples were collected at 8 stations across the Dogger Bank for analysis in the laboratory.
- Aim 9.** Samples of surface sediment were collected at each of the 9 stations established for the ICES/IOC Bremerhaven biological effects workshop (extending NW from the River Elbe), and from 4 additional stations between Esbjerg and the Elbe. Samples of water, sediments and sediment elutriates were assayed using the bioassays listed under Aim 1 above. Preliminary results indicate increased algal growth along the transect towards the inner German Bight.
- Aim 10.** 30 kg samples of fine-grained surface sediment were collected from 4 stations and stored at -20°C.
- Aim 11.** Samples were collected from 12 of the 14 stations in and around the disposal area.

R J Law

20 July 1992

SEEN IN DRAFT :

P. Mackay (SFM)

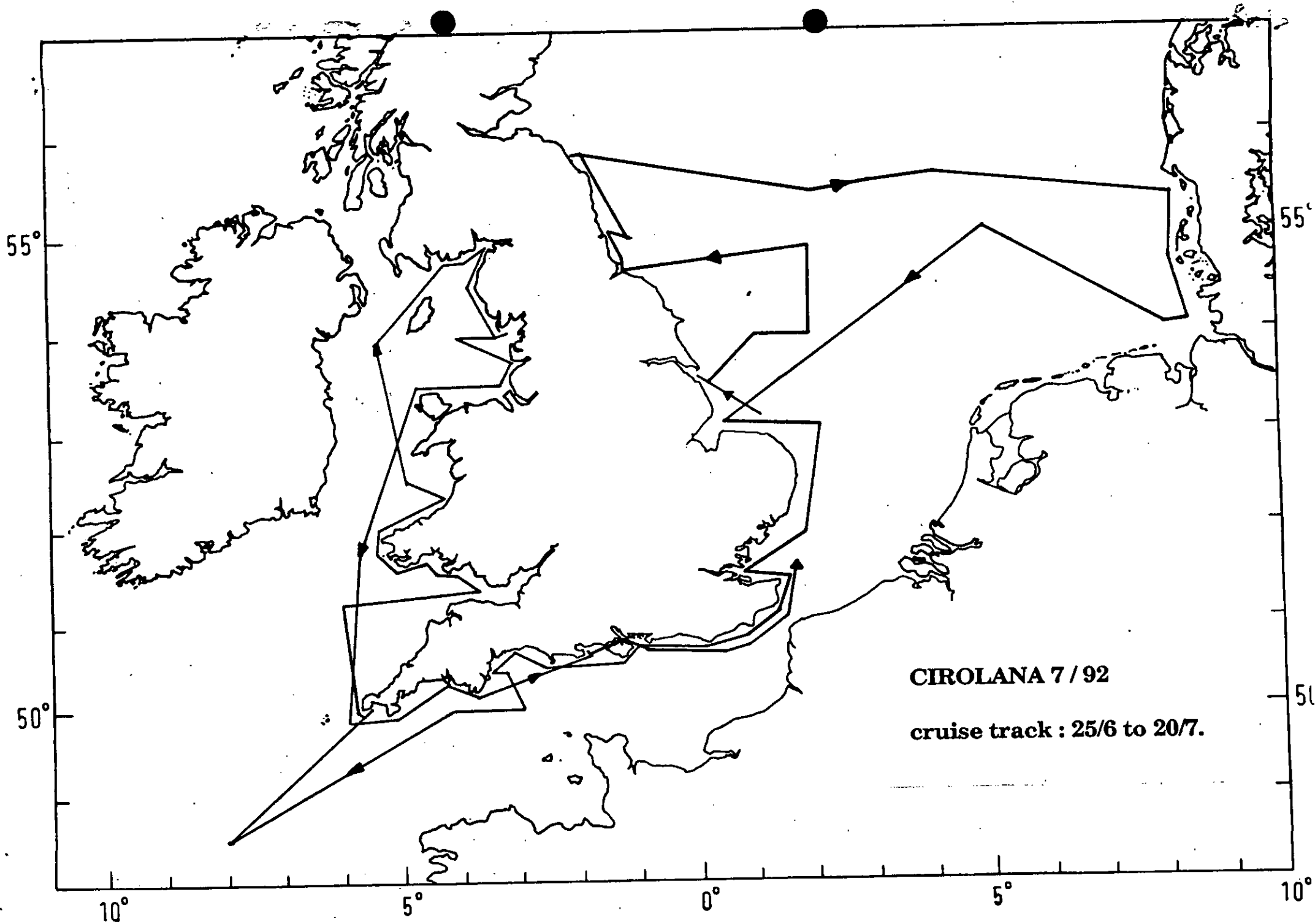
R. Jolliffe (Master)

INITIALLED : JP; JWR (pp CP)

DISTRIBUTION :

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Carole Kelly	R A A Blackman
Ruth Hamer	A Franklin
Rebekah Laslett	J M Davies (SOAFD)
Moir Salmons	P C Reid (DoE)
P R King	



CIROLANA 7 / 92

cruise track : 25/6 to 20/7.