

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

1987 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 4a

(PROVISIONAL: Not to be quoted without prior reference to the author).

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DURATION: Left Lowestoft 1335h 7 April 1987
Arrived Holyhead 1830h 20 April 1987
(All times are Greenwich Mean Time)

LOCATION: English Channel and Irish Sea

AIMS:

1. To conduct a detailed study of Liverpool Bay and the Outer Mersey and Ribble estuaries in terms of the distribution of trace metals in seawater.
2. To collect samples of seawater for trace metal analysis from offshore and coastal areas. This will be conducted in areas of the Channel and Irish Sea not so far covered for the ICES Baseline Study of trace metals in seawater.
3. To evaluate sample collection for organics and trace metals analysis using the "Seastar" automatic in situ sampler.
4. To collect samples of water, suspended particulate material and surface sediment for analysis for various organics, including organochlorine pesticides (particularly Lindane and Dieldrin), PCBs, coprostanol, nonyl phenols and PAH.
5. To collect and analyse by fluorescence spectroscopy samples of surface water in areas not so far covered for the ICES Baseline Study of total hydrocarbons in seawater.

NARRATIVE:

CIROLANA sailed from Lowestoft at 1335h and recalibration of her E.M. log was carried out off Corton, finally being completed at 1630h. CIROLANA then steamed south and into the English Channel where water sampling for analysis of trace metals and mercury began at 0259h on 8 April off Dungeness. Samples were taken at 10 mile intervals at first, subsequently

at 20 and finally 40 miles. In all 20 stations were worked along this first line, which was completed at 2326h on 9 April at 48°28'N 7°59'W off the Isle of Ushant. Depth profiles were taken for trace metals and hydrocarbons at this and the previous station respectively. CIROLANA then proceeded north through the Celtic Deep and St Georges Channel into the Irish Sea with stations again at 40, 20 and finally 10 mile intervals, anchoring 2 miles west of the Bar light in Liverpool Bay at 1500h 11 April. 36 stations had been worked in all by this time. During the next 7 days a series of 13 hour anchor stations were worked. These were situated near the Bar light, the sewage sludge and dredged spoil disposal grounds, and the Dee, Mersey and Ribble estuary mouths. Samples were taken at hourly intervals throughout a tidal cycle at each site. The final anchor station by the sewage sludge disposal site was completed at 2100h on 18 April. On 19 April samples were collected along a transect across the Ribble and then south and west across Liverpool Bay, beginning off Blackpool at 0730h and finishing 10 miles north of Conwy Bay at 1900h. The final sampling transect was begun at 0730h on 20 April to the northeast of the Morecambe Bay gas field and completed at 1310h off the north coast of Anglesey. 96 sampling stations were worked in all during the cruise. CIROLANA then proceeded to Holyhead where staff disembarked at 1830h.

RESULTS:

As the weather was generally settled during the period of this cruise all planned sampling was successfully carried out.

- Aim 1. Samples were collected through tidal cycles at 7 anchor stations in the study area. Additional samples were taken from CIROLANA at 16 stations offshore and, using the ship's Searider boat, at 32 stations inshore. This allowed sampling to be carried out in very shallow waters over the Burbo Flats, within the Ribble Estuary, and into the Queen's Channel at the Mersey entrance. Samples were analysed for cadmium and lead at sea using anodic stripping voltammetry, but unfortunately mercury determinations could not be made at sea as the analyser had broken down before the cruise. Samples were stored for subsequent analysis at Burnham. The whole of the planned programme of sampling was successfully completed.
- Aim 2. Samples were collected at 36 stations in the English Channel and Irish Sea, covering all the areas which could not be sampled during CLIONE 3/86 due to bad weather.
- Aim 3. The "Seastar" sampler was deployed at each of the 7 anchor stations, and operated successfully at 5 of these. The failure of the sampler to pump at the first 2 stations was due to setting too high a flow rate for the suspended particulate load, and once this was optimised no further problems were seen. As 12 hour deployments proved to be necessary to collect sufficient material for analysis of organics, no samples were collected for trace metal analysis and the use of the "Seastar" for this purpose will be investigated at a later date.

Aim 4. Filters and extracts from the resin columns of the "Seastar" sampler were stored for analysis of organochlorine pesticides and polychlorinated biphenyls to be carried out at Burnham. Samples of surface sediment taken at each of the anchor stations were frozen and will be analysed for pesticides and polycyclic aromatic hydrocarbons (PAH), and suspended particulate material collected at these same stations will also be analysed for PAH. In addition 43 samples of subsurface water were taken for analysis of coprostanol and nonyl phenols. These samples were collected from the vicinity of the sewage sludge disposal site and the Dee, Mersey and Ribble estuaries.

Aim 5. As for Aim 2 samples were taken and analysed from stations in the English Channel and Irish Sea, and also at the anchor stations and some of the other stations in Liverpool Bay. In all 118 samples were analysed by fluorescence spectroscopy during the cruise. The extracts were stored and selected samples will be further analysed by gas chromatography at the Burnham laboratory.

R J Law
28 April 1987

SEEN IN DRAFT: M J Willcock (Master)
E W Pearson (Fishing Skipper)

INITIALLED: HWH

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