

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

1997 RESEARCH VESSEL, PROGRAMME.

REPORT: RV *CIROLANA*; CRUISE 5b/97

STAFF: J Thain (SIC)
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DURATION: 8 June - 23 June 1997

LOCATION: Bristol Channel, Celtic Sea, Irish Sea and North Sea.

AIMS:

1. To collect samples of demersal fish for chemical analysis from the North Sea and Irish Sea in support of UK National Monitoring Programme (NMP), Environmental Quality Objective Programmes and the EC Fish Products and Shellfish Hygiene Directive.
2. To deploy fractionation / bioassay techniques on water samples from offshore and estuarine locations for chemical analysis of organics and biological effects studies.
3. To collect samples from the Celtic Sea and Irish Sea for sediment and pore water bioassays in support of the Irish Sea QSR and in the development and evaluation of sediment bioassay techniques.
4. To collect fish samples at NMP sites for genetic toxicological analysis (e.g. DNA adducts).
5. To further investigate the use of biomarker techniques in support of NMP and for developing and validating biological effects techniques for monitoring purposes.

ADDITIONAL AIMS:

6. To sample horse-mussels from the Humber/Wash area for later analysis of contaminants in flesh.
7. To collect sediment samples at the Tees dredgings disposal site for later bioassay work.

8. To collect 3m beam trawl samples at selected NMP sites for the analysis of litter content.

9. To conduct characterisation studies at representative NMP sites and sites of special interest using a sediment grab and corer and to collect sediment core samples at selected NMP locations for PCB and PAH analysis.

NARRATIVE: (all times are GMT)

Scientists from the Burnham-on-Crouch Laboratory boarded *CIROLANA* at Swansea on Sunday, 8 June. *CIROLANA* sailed at approximately 2100 h on the evening tide of 8 June and steamed overnight to Nash Point (NMP 615) in the Bristol Channel and commenced fishing on the morning of 9 June. Water samples were also taken using a churn sampler; sediment sampling was aborted due to the hard substrate. In the afternoon *CIROLANA* steamed to Swansea Bay and completed a fishing station, one water and two sediment stations on the dredged material disposal site using a churn and Reineck Box corer respectively (aims 1,3,4 and 5). Later that evening two further water and sediment stations were completed in mid and west Carmarthen Bay.

On the 10 June four fishing stations were completed in East, West, inner and mid Carmarthen Bay. Overnight *CIROLANA* proceeded to St Brides Bay and completed a fishing station under aim 5. On the afternoon of the 11 June *CIROLANA* proceeded to Milford Haven and anchored at Dale Shelf Anchorage; the ship's Searider was deployed in the estuary and water and sediment samples were collected at three stations, up to and including Milford Shelf (aim 3). After leaving Milford Haven *CIROLANA* steamed to the Celtic Deep NMP station to collect fish using the Granton trawl, water with the churn sampler and sediment using the Reineck corer. After completing this station at 0030 h on 12 June *CIROLANA* sailed to the NMP station 655 at inner Cardigan Bay where sediment samples were taken: cores using the Reineck box corer; a grid of six using the Bowers and Connelly multi mini corer; a grid of five and a grid of nine using the Day grab (aim 9). Fish and water samples were also taken and in addition the 3m beam trawl was deployed on three occasions (aim 8). Further fish, water and sediment samples were taken at the outer Cardigan Bay NMP station (665) on the 12 June (aims 1,3,4 and 5) as *CIROLANA* steamed to Liverpool Bay.

On the morning of 13 June *CIROLANA* arrived in Liverpool Bay. Fish, water and sediment core samples were taken at NMP stations 775 (Red Wharf Bay), 715 (Liverpool Bay), 705 (Burbo Bight), 795 (Morecambe Bay) and 805 (SE Isle of Man). In addition fish were also sampled (Granton Trawl) at the TREND site off Rhyl under aim 1, and water samples were taken at four stations on the River Mersey estuary (Tranmere Oil Terminal, Seacombe Ferry, C20 buoy and Crosby Channel) using the ship's Searider (aim 2). Sediment samples taken at the SE Isle of Man station included; a grid of five with the multi-corer, a grid of six and a grid of nine with a Day grab. This work was completed at 1600 h on the 15 June (aim 9).

CIROLANA then steamed to Dundrum Bay (NMP 815) and on route deployed a scallop dredge south of the Isle of Man to collect a sample of Queens and scallops under aim 1. On the 16 June, at Dundrum Bay, fish, water and sediment was collected using the Granton trawl, churn sampler and Reineck Box corer (aim 1,3,4 and 5). The 3m beam trawl was deployed under aim 8, and sediments were collected with the multi-corer (grid of five) and Day grab (grid of five and a grid of nine) under aim 9. *CIROLANA* then steamed north and on the evening of the 16 June collected water and sediment at NMP stations 825, 855, 835, and 845, in Belfast Lough, the latter two were collected with the ships Searider (aims 2 and 3).

CIROLANA then steamed north about to the North East coast arriving off the River Tyne on the evening of the 18 June. On the morning of the 19 June water samples were taken at the mouth of the River Tyne and at three stations on the estuary using the ships Searider (aim 2). In the afternoon *CIROLANA* proceeded to the Off Tees NMP station (245) to trawl and to collect a water sample. This was completed by 1545 h and *CIROLANA* proceeded to the River Blyth, deploying the scallop dredge on route to collect a sample of queens and scallops(aim 1). *CIROLANA* arrived off Blyth at 1900 h; water samples were taken at the mouth of the River Blyth from the ship and at two stations in the estuary using the ships Searider (aim 2). Overnight *CIROLANA* steamed to the west Dogger Bank and trawled at NMP station 285 on the morning of the 20 June. Water samples were also taken at this station and *CIROLANA* then proceeded to the River Tees. At the mouth of the River Tees water samples were taken from the ship and from four stations on the Tees estuary using the ships Searider (aim 2).

On the morning of the 21 June *CIROLANA* was in position on the Tees dredged material disposal ground where a series of sediment samples were taken; at three stations with the Reineck box corer in the centre of the disposal site, and at three stations on the edge of disposal site using a Day grab (aims 7 and 9). This was completed at 1415 h and *CIROLANA* then moved to a position 3 miles north of the dredged material disposal site to trawl for fish and take a water sample and STD (NMP 295, Off Tees). After completing this station *CIROLANA* headed south and deployed the scallop dredge off Scarborough and Flamborough Head to obtain whelks and Queens for aim 1.

CIROLANA arrived off the Humber (53.33.5 N 00 33.7 E) on the morning of 22 June and deployed the Rock Dredge to sample Horse Mussels under aim 6 During the afternoon and evening *CIROLANA* steamed south and trawled for fish and sampled water at NMP stations 375 (Off Humber) and 385 (Wash) for aims 1,4 and 5. *CIROLANA* then steamed for Lowestoft and docked on the morning tide on 23 June.

Sea conditions throughout the cruise were good and no time was lost due to bad weather

RESULTS:

Aim 1. Samples of whiting, plaice and dab in five consecutive length stratified groups were collected for Trend purposes from Liverpool Bay. Whiting, dab and plaice from Liverpool Bay and Morecambe Bay were collected for EQS purposes. Whiting, dab

and plaice were collected at all NMP sites and sites of special interest in support of the NMP programme and biological effects work. Queen scallops were collected from two locations, SE Isle of Man and NE Coast, for contaminant monitoring under the Shellfish Hygiene Directive. No sample was obtained at the station off Humber. All samples were stored at - 20° C for chemical analysis at the Burnham Laboratory.

Aim 2. Twenty-eight 20 l water samples were taken from estuarine and coastal stations and extracted on-board using C2/ENV+ solid phase cartridges for chemical analysis of organics (fractionation processing) and biological effects studies at Burnham.

Aim 3. Sixteen sediment samples were collected in the Irish and Celtic Seas from NMP stations and sites of special interest using the Reineck box corer. These sediments were stored at 4° C and will be bioassayed at the Burnham Laboratory using whole sediment bioassays. At four sites pore water was also extracted for bioassay at the Burnham Laboratory.

Aim 4. Dab and plaice livers were collected at 18 sites and stored in liquid nitrogen for genetic toxicological analysis (DNA adducts) at the Lowestoft Laboratory. Blood smears were also taken from fish at four sites for micro nuclei analysis.

Aim 5. Fish tissue was collected from dab and plaice at 14 NMP stations and 4 sites of special interest for biological effects investigations using biomarkers and fish disease (liver pathology): dab and plaice livers were collected and stored in liquid nitrogen for measurement of EROD activity; accompanying bile was collected for PAH analysis; livers were also collected from dab and plaice and stored in buffered formalin for liver pathology.

Dab and plaice muscle tissue was collected from 18 sites and stored in liquid nitrogen for AChE activity. Seventy two water samples for OPs and carbamates were taken from NMP and selected estuarine sites and subjected to solid phase extraction for GCMS analysis at the Burnham Laboratory. Whelks were collected from five sites for the identification of imposex and for TBT analysis. Water samples from sixteen sites and sediment from fourteen sites were also collected for TBT analysis.

Aim 6. The Rock Dredge was deployed at several sites throughout the Humber/Wash disposal site but no Horse mussels were collected.

Aim 7. Sediment samples were collected from three sites on the Tees dredged material disposal site using the Reineck box corer. The sediments were stored at 4° C for whole sediment bioassay at the Burnham Laboratory. Pore water was also extracted from the sediments for subsequent bioassay and comparison with meiofauna data obtained at the same sites.

Aim 8. Three NMP stations, 655, 805 and 815, were successfully trawled using a 3m beam trawl for the analysis of litter.

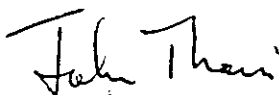
Aim 9. Sediment samples were collected for characterisation studies using a series of Day grabs at NMP stations at Inner Cardigan Bay (655), SE Isle of Man (805) and

Dundrum Bay (815). In addition the Bowers and Connelly multi-mini-corer was also successfully deployed at these NMP stations for meiofauna studies. The Day grab was used on a series of stations on the Tees dredged material disposal site to collect samples for macro benthic investigations. All samples to be worked up at the Burnham Laboratory.

Sediment cores of 45 cm in depth were taken using a Reineck box corer at NMP stations at Inner Cardigan Bay (655), SE Isle of Man (805) and Dundrum Bay (815) for PCB and PAH profiling.

Acknowledgement: I should like to acknowledge the support and help of the ship's officers and crew in completing the above programme of work.

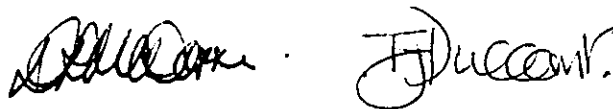
SIC: John Thain
22 July 1997



SEEN IN DRAFT: : Captain Don McDarren (Master)

Trevor Durrant (Fishing Skipper)

INITIALLED:



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CIROLANA 56/97 CRUISE TRACK

