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## BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 09/95

Date 13 - 18 May 1995

### PERSONNEL

B Stewart	(SIC), SSO, DANI
I Heaney	SPSO, DANI
W Clarke	SSO, DANI
R Hensley	HSO, DANI
P Elliott	SO, DANI
S Bloomfield	ASO, DANI
L Blee	Student, University of Ulster

### CRUISE OBJECTIVES

- i. To assess temperature, salinity and nutrient distributions in the north western Irish Sea.
- ii. To recover, service and redeploy instrumentation moored in the central Irish Sea.
- iii. To assess water current movement with depth, over selected areas of the cruise track, using the ship's acoustic doppler current profiling system.
- iv. To compare macrofaunal composition in sediment over different areas of the north western Irish Sea.

### CRUISE NARRATIVE

Saturday 13 May 1995

A faulty Hydro-Bios CTD caused the ship's departure to be deferred until 2200 hrs in order that a replacement CTD system, scheduled for early afternoon delivery, could be used during the cruise. Later, the carrier company rescheduled delivery of the CTD for Sunday. Mr Clarke and Mr Elliott remained at AESD to accept delivery and prepare the CTD system for operation while the cruise proceeded with the benthic survey work. In preparation for the cruise, the remaining scientific crew were onboard by 2000 hrs when equipment and instrumentation was tested and confirmed to be functioning properly. The RV Lough Foyle departed Belfast at 2200 hrs and sailed overnight to benthic survey station 47 (see attached sampling grid).

Sunday 14 May 1995

Work for the day commenced on station 47 at 0600 hrs. The weather was dry and bright with light winds. The box sediment corer was deployed unsuccessfully several times until it became apparent that the coarse sand and gravel at this station prevented the corer from properly sealing the sediment contents within the box during recovery

to the ship deck. At this stage, work with the corer on this station was abandoned. The vessel sailed to arrive on benthic survey station 54 at 1300 hrs where the box corer was successfully deployed seven times, acquiring undisturbed profiles of sediment. Work finished at 1600 hrs and the vessel sailed back to Belfast where Mr Clarke and Mr Elliott were waiting to install the new CTD on the ship. Installation of the CTD was completed at 2300 hrs and the vessel sailed overnight, in light winds, to the mooring site at station 38.

#### Monday 15 May 1995

Recovery of the moored water samplers to the ship deck commenced at 0700 hrs and was completed at 1000 hrs. The vessel then sailed to Carlingford Lough to rendezvous with the Department's fisheries protection vessel MV Ken Vickers at 1315 hrs, when Dr Heaney and three personnel from Fisheries Division were transferred to the Lough Foyle. Following lunch, the visitors were given a tour of the vessel and were returned to the MV Ken Vickers at 1500 hrs. Dr Heaney remained on the Lough Foyle to assist with the remainder of the survey. The vessel returned to the mooring site at station 38. During the visit, work continued with servicing the recovered water samplers and at 1830 hrs the samplers were attached to the mooring and redeployed at positions  $53^{\circ} 51' .09N$   $05^{\circ} 33' .42W$ . The benthic survey continued from 1915 hrs at station 38 where the box corer was successfully deployed ten times. Work for the day was completed at 2220 hrs and the vessel drifted overnight in light winds.

#### Tuesday 16 May 1995

Recovery of the second mooring of sediment traps, current meters and a transmissometer commenced at 0615 hrs and was completed at 0645 hrs. The instruments were individually serviced and attached to the mooring which was redeployed at 1035 hrs at position  $53^{\circ} 51' .12N$   $05^{\circ} 33' .86W$ . The cruise programme continued along a grid of sampling stations 45, 50, 57, 62, 59 and 48 where work was completed at 2040 hrs. Overnight the vessel drifted in light winds.

#### Wednesday 17 May 1995

Work commenced on station 49 at 0700 hrs and continued in a northerly direction along a grid of stations 46, 47, 36, 33, 24, 26, 22, 21 to finish on 16 at 1850 hrs. The vessel returned to benthic survey station 54 where the box corer was successfully deployed a further three times. Work for the day was completed at 2030 hrs and again the vessel drifted overnight in light winds.

#### Thursday 18 May 1995

Work commenced on station 15 at 0700 hrs and continued in a northerly direction along a grid of stations 15, 14, 6 to finish the survey on station 4 at 1030 hrs. The vessel sailed to dock in Belfast 1330 hrs where scientific personnel disembarked at 1430 hrs.

## PARAMETERS MONITORED

The CTD/rosette water sampler was deployed at all stations on the sampling grid, to acquire nutrient, chlorophyll *a*, temperature, salinity, oxygen and fluorescence data from the depth profile. Daylight permitting, Secchi disc readings were also taken at all stations. Underwater light measurements were made using a multi spectral light meter at stations 38 & 45. Algal samples were taken at most stations and stored frozen for carbon/nitrogen analysis. Sediment cores were taken at stations 47 & 38 where and sub sampled for C/N and chlorophyll *a* analysis. Samples were taken for the determination of oxygen by the Winkler method at stations 38, 45 & 50.

The ship's ADCP was prepared and initiated in Belfast and set to monitor along the cruise track.

## SUMMARY OF RESULTS

Nutrient and CTD profile data for southern coastal stations 36, 47, 48 & 59 showed the water column to be mixed with typical temperature and salinity 10.3 °C and 33.80 ppt respectively; typical inorganic nitrogen values ranged 0.3 - 1.0 micromoles N l<sup>-1</sup>. The northern coastal stations 14, 15, 22, 24 & 33 were also mixed but cooler with typical temperature and salinity 8.5 °C and 33.90 ppt respectively; typical inorganic nitrogen values ranged 2.0 - 6.0 micromoles N l<sup>-1</sup>.

The high salinity 34.4 ppt, observed at southern open sea stations 62 and 57 during the March cruise, was now only observed below 50 metres, with typical surface salinity 34.0 ppt. Temperature however remained constant throughout the profiles; typically 9 °C. Open sea stations 45 & 38 directly north of this region, exhibited thermal stratification with surface temperatures typically 10 °C, approximately 2 -3 °C above the bottom temperature. Station 26 immediately north of station 38, was also thermally stratified and contained a 20 m band of 34.4 ppt salinity water at 80 m depth. Further north, stations 21 and 16 were mixed and were similar to stations 6 and 4 in the North Channel with typical temperature and salinity 8.4 °C and 34.0 ppt respectively; typical inorganic nitrogen values ranged 7.0 - 9.0 micromoles N l<sup>-1</sup>.

### Moored water sampler

Preliminary results from daily samples analysed for inorganic nitrogen and orthophosphate are shown in Figure 1.

## PROBLEMS ENCOUNTERED

### Light Meter

Depth sensor on the light meter was not reading correctly as surface was displaying depths of 6 - 7 metres. W Clarke to investigate the fault.

### Acoustic Doppler Current Profiler

Occasional "bad beam" warning from the ADCP meant it was not possible to monitor along the entire cruise track. W Clarke to liaise with L Fernand (MAFF) over this problem.

### Hydrographic Winch

Depth counter on the hydrographic winch did not function. The fault was reported to both the ship's officers and ship's manager.

### **ACKNOWLEDGEMENTS**

I thank Mr Clarke for his effort in acquiring and commissioning a replacement CTD in such a short space of time. His valued input made a major contribution to the overall success of the survey cruise.

The ship's master, officers, engineers, catering staff and crew are thanked for their cooperation during this cruise.



**BM STEWART**

8 June 1995

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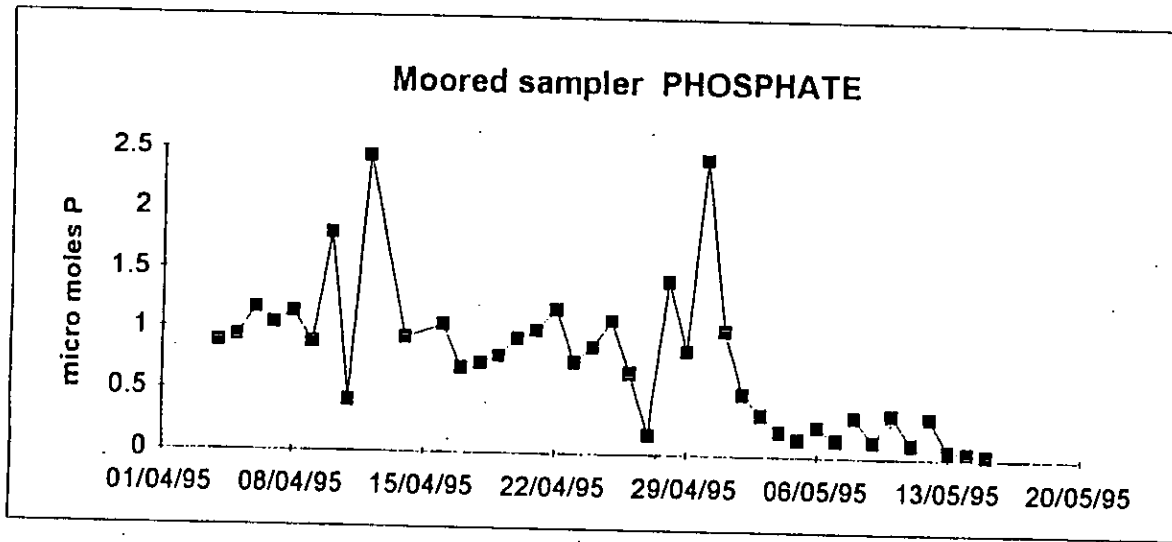
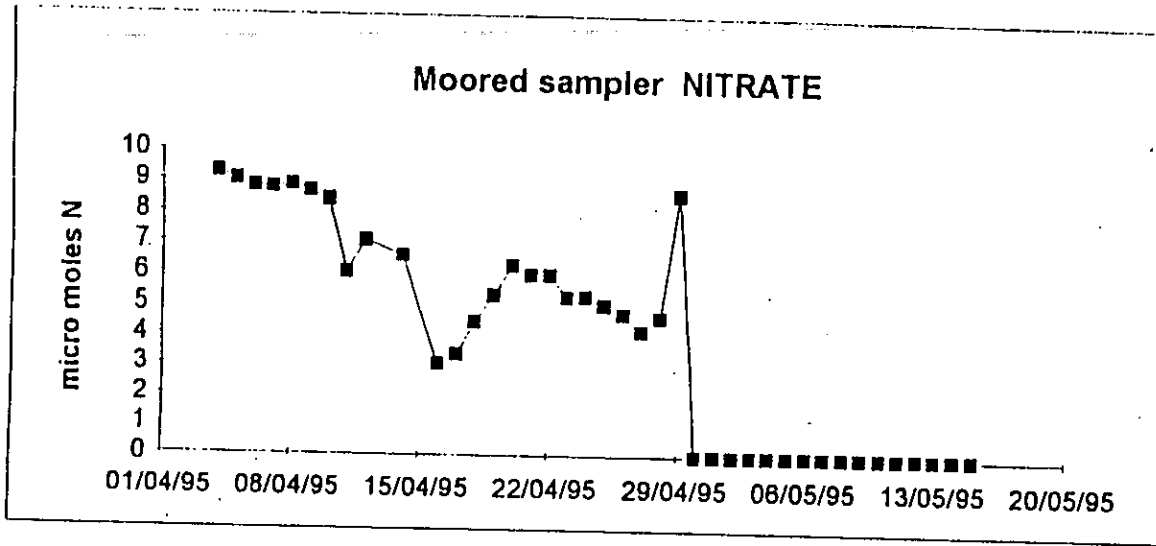
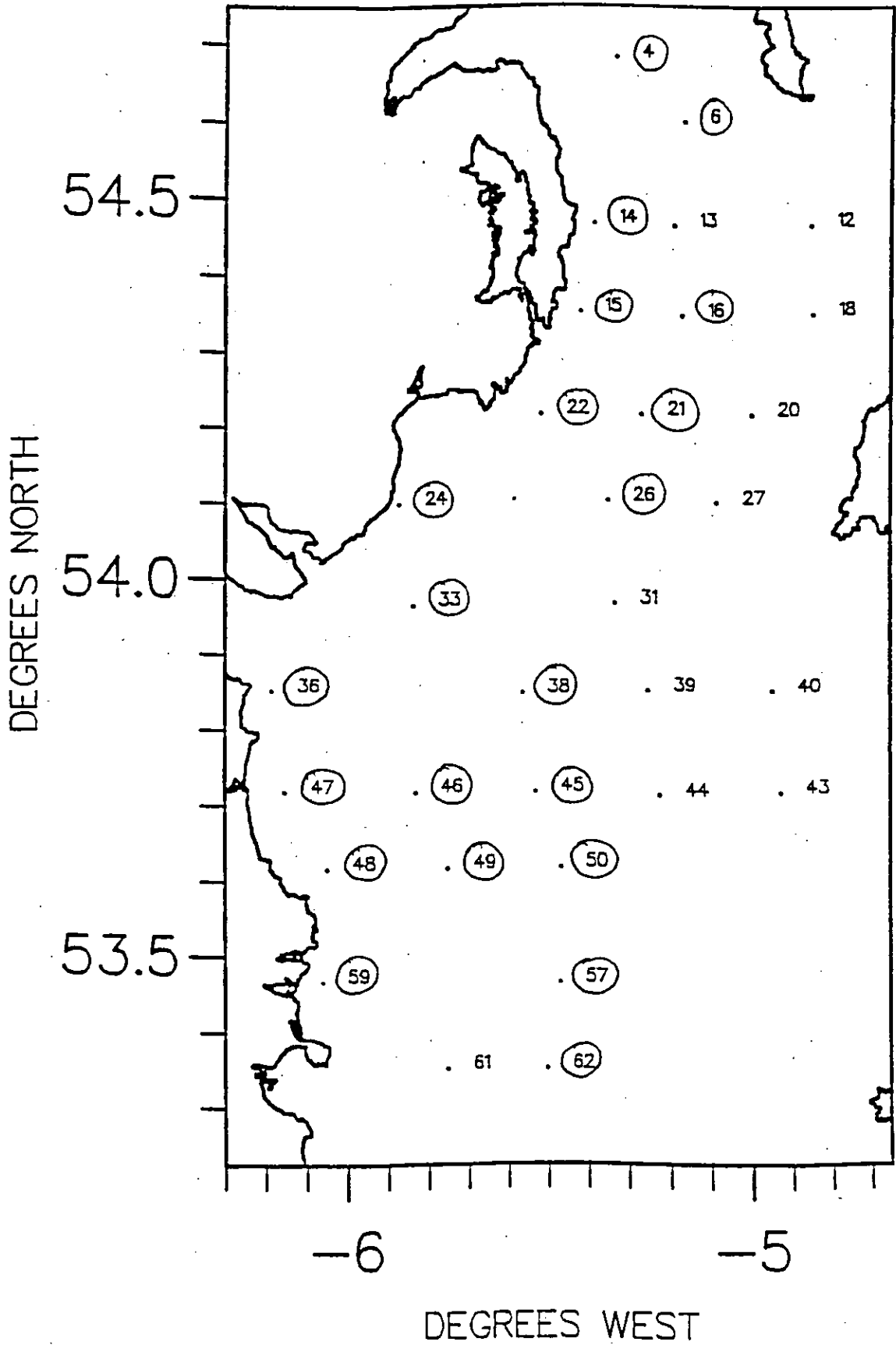


Figure 1

Proposed sampling stations for Biological  
Oceanography cruise 13-19 May 1995



Additional Beulbe Survey station 54  
at position 54 21 N 05 07 W