5660

MRV LOUGH FOYLE CRUISE REPORT LF/7/91

Cruise Personnel:

C Gibson	PSO	SIC
W Clarke	SSO	
B Stewart	HSO	
C Reavy	SO	
R Bailie	ASO	
P Elliott	ASO	

Cruise Objectives:

1. To map the surface water nutrient concentrations, temperature and salinity of the NW Irish Sea.

2. To validate the use of the ship's clean seawater supply as a sample point for continuous analysis.

3. To make trial measurements of the underwater light with the newly-acquired quantum meters.

CRUISE NARRATIVE

Equipment was loaded and installed on Friday, 8 March. Scientific staff boarded on the evening of 10 March and made final preparations for the next morning. Vessel departure was delayed 1 hour due to dense fog and congestion in the Belfast shipping lane. The vessel arrived at the first station at 10.00 am. Continuous recording of surface water salinity and temperature began, logging data at 5 minute intervals. Samples for water analysis were taken over the side at 5 m depth and, for comparison, some were also taken from the ship's clean water supply. Salinity in the early stations was lower than expected, but rose with passage South.

All equipment functioned well in the initial stages, although there were occasional software problems with both the CTD and Microplot. CTD data was entered manually into LOTUS 123 from the printer output as it became available and this worked well. Everything was made very easy by the calm weather and the only wind got up during the early hours of 12 March, but soon died away. For much of the cruise visibility was restricted and this sometimes meant a loss of time when shipping traffic was heavy.

The Day grab was deployed at 54 06N 5 20W for Dr Service, but yielded only soft grey mud with little living material retained by the 1 mm sieve. The Day grab wire jams in the top pulleys and sometimes does not trip, several drops were failures.

A full safety muster was held during the afternoon, including the use of the respirator and conveying R Bailie below deck strapped in a stretcher. He survived.

During the night of 12-13 March, the vessel was again delayed by the fog and a congregation of fishing vessels. During this and subsequent nights, several birds came aboard. Apart from numerous starlings, a robin took up residence in the wet lab. There were also a pair of meadow pipits and a redwing. Apart from the night visitors, W Clarke was roused during the night to fix microplot which had crashed at 5.00 a.m.

Chlorophyll *a* extractions were carried out on board on 12 March and subsequently, extracting into hot methanol. SRP analyses were also carried out and these revealed that the discrepancy between the outboard and inboard analyses only occurred in the North Channel and near the Solway Firth. Replication between analysis from the same source was excellent and it is concluded that the discrepancy may reflect a real difference between the two samples in that area. It is obvious from the salinity and temperature data that the water mass structure there is very complex and the low salinities suggest a considerable freshwater influence. It is suggested that the ship's clean water supply is taking a disturbed 0 to 5 metre integrated sample which sometimes containers less SRP than a 5 m depth sample. Further South, where the salinities exceeded 33 ppt, the problem disappeared.

The submersible quantum sensors were deployed successfully on the afternoon of 13 March in ideal conditions. An interesting profile of both downwelling and upwelling light was obtained and bore out the Secchi disc readings that light attenuation is rapid. A small lake plankton net was hauled from 75 m to the surface at 20.00 h. Interference on the CTD monitor occurred once or twice but, although on these occasions the graphic display could be seriously corrupted, the data was not impaired.

Delays due to the fog and heavy shipping again occurred during the night 13/14 March and two easterly sample points were abandoned to make up some time. Eventually, the Irish coast off Malahide was reached around 07.30 and it was decided to turn immediately and head for the first projected profile station. The CTD and rosette sampler were readied on deck and functioned until immersion at the first station. The system then failed and a protracted and valiant attempt at repair was made by W Clarke, aided by the Bosun and Mr Lynch, including two complete re-splices of the cable joint. Eventually it had to be concluded that there was an electrical short within the cable or hydrographic winch and this could not be rectified on board. This requires urgent resolution if profiling is to be carried out on the next nutrient cruise. Some kind of a back-up system must also be devised if such a simple but irremediable fault is not to cause problems again.

Two more light profiles were taken during the period of repair, but eventually at 15.00 hours it was concluded that there was nothing more to be gained by staying on station and we began the steam home. Samples for comparison between the CTD and laboratory measurements of salinity were taken on the way home and more comparative samples were taken in the North

Channel. The scientific staff unloaded and left the vessel around 9.00 am on Friday 15 March.

I would like to record my appreciation of the excellent team spirit and high quality of work by all the scientific staff and especially, on this occasion, to Willie Clarke for being the man who can, and usually does.

Chris Gibson

List of equipment faults and repairs 14/3/91

1. Tandon 1 crashed due to reported stack fault. ADVEC engineer had already tried to diagnose this fault before start of cruise without success as this is a very intermittent fault.

2. Unable to dump multiplot graphics due to lack of a suitable printer.

3. CTD display corrupted on occasions. Is this due to interference by ship's equipment?

4. Day grab not always firing, requires new guide pulleys.

5. Hydrographic wire faulty and in urgent need of repair or replacement.

Deployment of equipment 14/3/91

1. Water sampler Casella at 5 m depth from telescopic crane.

2. Secchi disc Outside wet lab door.

3. CTD and fluorometer continuous mode 701 plastic dustbin fed ship's clean seawater from cock outside wet lab.

4. Day Grab Telescopic crane and hydrographic winch. Sieved on deck.

5. Light meters Deck sensor attached by magnet to control cabin roof above plot room. Submersed sensors deployed on marked handline using telescopic crane as a boom.

6. CTD profile mode system failed, not deployed.

7. Multinet plankton sampler: Not used.

8. Small lake plankton net. Hauled very slowly bottom to surface with small hydrographic winch.