Department of Agriculture and Rural Development (Northern Ireland)
Agriculture and Environmental Science Division

Cruise Report: LF 3103
Vessel: RV *Lough Foyle*
Date: 27th – 29th July 2003
Area: Irish Sea (north); ICES div. VIIa
Survey Type: Biological Oceanography & Mooring Service

Personnel:

B Stewart(SIC)	SSO	DARDNI
C Smyth	SO	DARDNI
R Gilmore	SO	DARDNI
A M Coyle	ASO	DARDNI

Objectives:

i. To maintain a nutrient and remote monitoring programme at mooring stations 38A and 47D.

ii. To assess temperature, salinity and nutrient distributions over depth at stations 38A and 47D.

Cruise Narrative:

Sunday 27 July 2003
In preparation for the cruise, all DARDNI scientific crew were onboard by 2000 hrs when mooring components and the automated sampler were prepared for deployment. Following a talk on ship's safety and a demonstration of personal life saving equipment, the RV Lough Foyle departed Belfast at 2045 hrs and sailed overnight in a light wind to station 38A mooring site.

Monday 28 July 2003
The vessel arrived on the mooring site at 0600 hrs when the weather was dry and cloudy with a fresh southerly breeze. As the weather was forecast to deteriorate, work for the day started earlier than usual at 0715 hrs with the complete instrument mooring eventually recovered to ship deck at 0800 hrs. The mooring components were inspected for corrosion and parts replaced where necessary. The thermistor chain was removed from the mooring wire, temperature data downloaded and individual units

reprogrammed. The CTD's and fluorometer were also removed, data downloaded and reprogrammed. The "large volume" sub-surface water sampler was reprogrammed and attached to the mooring wire. The nutrient water sampler was replaced. The mooring components were reassembled and readied for deployment. The CTD's, and fluorometers were attached and the mooring redeployed at 1108 hrs on position 53^0 46^l.965N 05^0 38^l.057W.

Following deployment of the water sampler and zooplankton net the vessel sailed in a strong southerly wind to the in shore-mooring site 47D. The vessel arrived on station at 1530hrs and commenced to drag for the anchor and ground line of the previously damaged mooring. The components were eventually located and recovered to ship deck at 1830 hrs. The ground line was renewed, buoy attached and the mooring redeployed at 1930 hrs on position 53^0 44^l.446N 06^0 03^l.967W.

Following deployment of the water sampler and zooplankton net the vessel sailed to dock in Belfast at 0830 hrs Tuesday.

Tuesday 29 July 2003

Work for the day commenced at 0745 hrs when samples and equipment were removed from the vessel and returned to Newforge Lane. The scientific crew disembarked at 0945 hrs.

Parameters Monitored:

The CTD/rosette water sampler was deployed at stations 38A and 47D to acquire nutrient, chlorophyll *a*, temperature, light and salinity data from the depth profile. Three zooplankton net hauls were taken at stations 38A & 47D.

Moored Instrumentation:

The "nutrient" water sampler located at depth 12 metres functioned as programmed. Duplicate samples, for nutrient analysis, were taken every second day during the period 16 June – 28 July 2003. Unfortunately a second "large volume" water sampler did not function. It appears that the instrument had not accepted the programming details. Temperature data recorded at 3 hourly intervals was recovered from seven thermistors positioned at intervals throughout the water column.

Temperature, salinity and fluorescence data recorded at 15 minute intervals was recovered from CTD's positioned near surface and near bottom at station 38A.

Summary of Results:

The CTD data from station 38A shows a thermally stratified profile with a 3.8 ^{0} C difference between the surface and bottom layers. Temperature throughout the profile shows a sharp increase (approx. 2 ^{0} C) since the June 16 survey with the bottom layer, although cooler, showing a greater increase than the surface layer. This may be due to heat transfer from the upper layers through mixing across the thermocline.

Comparing July nutrient with data from the June 16 shows further evidence of mixing. In June, nutrients were concentrated in a narrow layer above the seabed, whereas currently this layer shows a reduction in concentration as an upper layer extending to the thermocline shows an increase. Data from the moored sampler at depth 12 metres shows no evidence of nutrient enrichment above the thermocline. The in-shore shallower station 47D exhibits a similar picture of nutrient depletion in the surface layers with thermal stratification, although temperature and salinity values are generally lower than observed offshore.

Hotel Report & Operational Aspects of the Ship:

During the cruise the A-frame, main trawl winches, both hydrographic winches and the ship's clean seawater supply were used. No problems were encountered with any of the ship's equipment nor indeed with any of the scientific equipment. The hotel and catering service was of the usual high standard and there was a good working relationship between the scientists and the ship's crew. Prior to the ship departing Belfast a comprehensive and detailed safety briefing was delivered to the scientific crew.

Acknowledgements:

I am indebted the deck crew of the RV Lough Foyle for their co-operation and assistance, particularly during the mooring recovery and deployment operation. The ship's master, officers, engineers and catering staff are also thanked for their co-operation during this cruise.

B M STEWART

7 August 2003