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

Cruise Report: LF 2503
Vessel: RV *Lough Foyle*
Date: 15th – 17th June 2003
Area: Irish Sea (north); ICES div. VIIa
Survey Type: Biological Oceanography & Mooring Service

Personnel:

B Stewart(SIC)	SSO	DARDNI
C Smyth	SO	DARDNI
A Downie	ASO	DARDNI
A M Coyle	Res. Assist.	QUB

Objectives:

i. To maintain a nutrient and remote monitoring programme at mooring stations38A and 47D.

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

Cruise Narrative:

Sunday 15 June 2003
In preparation for the cruise, all DANI 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 2100 hrs and sailed overnight in a light wind to station 38A mooring site.

Monday 16 June 2003
The vessel arrived on the mooring site at 0600 hrs and whilst surveying the area collided with the mooring sub surface buoy. The weather was dry and bright with a light breeze when work for the day started at 0745 hrs with the complete instrument mooring eventually recovered to ship deck at 0820 hrs. The sub surface buoy had been damaged and the Argos transmitter severed and missing as a result of the earlier collision with the ship. 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 serviced; samples removed, rebuilt, reprogrammed and attached to the mooring wire. The nutrient water sampler was replaced. The mooring components were reassembled and readied for deployment.

A replacement sub surface buoy and Argos transmitter was fitted. The CTD's, and fluorometers were attached and the mooring redeployed at 1250 hrs on position 53^0 46^l .876N 05^0 38^l .119W.

Following deployment of the water sampler and zooplankton net the vessel sailed to the in shore-mooring site 47D. The vessel arrived on station at 1600hrs when the torroid buoy was recovered and serviced. Following collision damage earlier in the year it was decided at this time not to renew the instrument leg of the mooring.

Following redeployment of the buoy and deployment of the water sampler and zooplankton net the vessel sailed to dock in Belfast at 0120 hrs Tuesday.

Tuesday 17 June 2003
Work for the day commenced at 0745 hrs when samples and equipment were removed from the vessel and returned to HQ. The scientific crew disembarked at 1130 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:
Both water samplers at approximate depth 7 metres functioned as programmed. Duplicate samples, for nutrient analysis, were taken every second day during the period 16 May – 15 June 2003. A second "large volume" water sampler took daily samples during the same period. 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 and near surface only at 47D.

Ship's Collision with Sub Surface Buoy:
Mooring components including wires and instruments total 85 metres. The depth given from the ship's echo sounder during deployment was 95 metres. This gives an ideal situation where the sub surface buoy is located 10 metres below the surface. Unfortunately on this occasion that was not the case as the sub surface buoy was located only 3 – 4 metres below the surface. Data downloaded from a depth sensor located on a sea bed anchor and a CTD located 10 metres above the anchor both confirm an average depth of 86.7 metres during the period of deployment. Over the tidal cycle depths ranged 83.8 – 88.8 metres.

During the forthcoming July mooring service the instrument anchor will be replaced and a side scan sonar survey carried out in order to assess the bathymetry of the mooring sea bed area.

Summary of Results:

The CTD data from station 38A shows a strong thermally stratified profile with a 4^0 C difference between the surface and bottom layers. This is associated with nutrient depletion in the upper layers with evidence of some nutrient upwelling during a spell of strong winds in early June. The lower saline upper layer is still in existence at the off shore station and indicates the stability of the gyre system in retaining this freshwater influence during the summer months. The in shore shallower station 47D exhibits a similar picture with intense thermal stratification and a salinity profile that is similar but generally lower than that observed off shore. Nutrient depletion is also associated with the warmer upper layer at this station.

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 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

11 July 2003