

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

**Cruise Report:** CO 1405

**Vessel:** RV *Corystes*

**Date:** 4<sup>th</sup> – 7<sup>th</sup> May 2005

**Area:** Irish Sea (north); ICES div. VIIa & VIa

**Survey Type:** Biological Oceanography & Mooring Service

**Personnel:**

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**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 3 April 2005

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 *Corystes* departed Belfast at 2100 hrs and sailed overnight in a light southerly breeze towards the mooring site at station 38A.

Monday 4 April 2005

The vessel arrived on the mooring site at 0600 hrs. The weather was dry with a light south-westerly wind when work for the day started at 0800 hrs with the complete instrument mooring eventually recovered to ship deck at 0910 hrs. The mooring components were serviced, instruments downloaded and reprogrammed. Samples were removed from the "biological" water sampler and the instrument rebuilt and programmed before redeployment at 1500 hrs in depth 93m on position 53<sup>0</sup> 46<sup>1</sup>.905N 05<sup>0</sup> 38<sup>1</sup>.179W. The rosette water sampler and zooplankton net were then deployed. The vessel then sailed to arrive at the inshore mooring station 47D at 1800 hrs when the instrument mooring was recovered to ship deck at 1800 hrs. Following a thorough service the mooring was redeployed at 1830 hrs in depth 29m on position 53<sup>0</sup> 44<sup>1</sup>.495N 06<sup>0</sup> 03<sup>1</sup>.944W. The rosette water sampler and zooplankton nets were

deployed. Work for the day finished at 2030 hrs and the vessel sailed overnight to NMMP 1 station on the north coast.

#### Tuesday 5 April 2005

Work for the day commenced at 0800 hrs at station NMMP 1 when the rosette water sampler and Day grab were deployed. The vessel then sailed in an easterly direction to a site north of Rathlin Island where the Day grab was again deployed. Work completed the vessel sailed overnight to the Turbitt Bank site off the eastern shore of the Isle of Man.

#### Wednesday 6 April 2005

Work for the day commenced at 0800 hrs when the Day grab was deployed a number of times to sample sediment across a section of the Turbitt Bank. Work completed the vessel sailed to a site off the Annalong coast where sediment sampling was attempted with the Hammond grab. After several attempts when only large pebbles were recovered, work was abandoned and the ship sailed to dock in Belfast at 2200 hrs.

#### Thursday 7 May 2005

Work for the day commenced at 0800 when scientific staff readied equipment for transfer to Newforge Lane. Work complete scientific staff disembarked at 1130 hrs.

#### **Parameters Monitored:**

The CTD/rosette water sampler was deployed at stations 38A, 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 McLane water sampler deployed at depth 20 metres functioned as programmed with the exception of the period 21 January to 28 February. During that period the sampler was lost from the mooring following a collision with an unknown vessel. The mooring was repaired and sampler replaced during the February NMMP cruise (CO 09 2005; SIC Dr. M Service). Aside this, duplicate samples, for nutrient analysis, were taken every second day during the reporting period 15 Nov' 2004 – 30 May 2005. Temperature data recorded at 3 hourly intervals was recovered during each mooring service from seven thermistors positioned at intervals throughout the water column.

Temperature, salinity and fluorescence data recorded at 15 minute intervals was recovered during each mooring service from CTD's positioned at near surface and near bottom at station 38A. Currently no instruments are deployed on the station 47D mooring.

#### **Summary of Results:**

##### Biological Oceanography: Station 38A

Data from the survey cruises during the period 15 November 2004 – 1 June 2005 demonstrate the changing cycle from the demise of the thermocline reported in

September 2004 through to the period of the spring bloom in April/May 2005. Nutrient profiles from November, January and February show a steady increase in nutrient concentrations throughout the profile, typically from 4.5 to 7.5 micromoles inorg N l<sup>-1</sup>. High-resolution nutrient data from the moored water sampler support this observation and identifies the winter “max” as occurring in mid March, almost four weeks earlier than last year. During April the surface layers of the water column are gradually depleted of nutrients as they fuel the spring bloom. Increased chlorophyll levels in these layers, typically 6 – 9 micrograms chlorophyll l<sup>-1</sup>, show evidence of the increase in biomass. Further depletion of the water column continues throughout May as up-welled nutrients are taken up during the spring bloom. CTD profiles from November, January and February are isothermal and show gradual loss of 5 °C over the winter months. April’s profile indicates the first sign of surface warming and is followed in early May by the development of a weak thermocline which is further strengthened towards the end of May. High-resolution temperature data from the moored surface and bottom thermistors show surface warming beginning in mid March. This coincides with the onset of nutrient depletion of the upper layers and the initiation of the 2005 spring bloom.

#### Biological Oceanography: Station 47D

An often-complex situation arises at this inshore station owing to the direct freshwater influence from the River Boyne. However during the survey period the pattern was similar to what occurred offshore. CTD profiles for November, January and February are generally mixed and show a gradual loss of 4.5 °C over the winter months with temperatures 1 – 2 °C below those recorded at the off shore site. Nutrient values during this period show a sharp increase from typically 5 to almost 9 micromoles inorg N l<sup>-1</sup>. CTD profile data from April, early and late May are mixed and show progressive warming. Nutrient data for this period show some nutrient depletion in April with a residual 3 – 5 micromoles inorg N l<sup>-1</sup> in the water column with almost total depletion of inorg N occurring during May. This is a similar pattern to what occurred off shore and despite the absence high-resolution data from moored instrumentation at this site it indicates a similarity in the timing of the spring bloom.

#### **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 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 to the deck crew of the RV *Corystes* for their co-operation and assistance during the mooring recovery and deployment operations. The ship’s master, officers, engineers and catering staff are also thanked for their co-operation during these cruises.

**B M STEWART**

28 July 2005