

Cruise Report

R.V. Lough Foyle Cruise LF3296 August (04 - 14)

Personnel

<i>Week 1</i>		<i>Week 2</i>	
R. Gowen (SIC)	SSO (DANI)	W Clarke (SIC)	SSO (DANI)
C Gibson	SPSO (DANI)	P Elliott	ScO (DANI)
I Heaney	SPSO (DANI)	S Bloomfield	ASO (DANI)
M Dickey-Collas	HSO (DANI)	J Guillot	QUB
P Elliott	ScO (DANI)	J. Batcheller	QUB
S Bloomfield	ASO (DANI)		
R Raine	Martin Ryan Institute (UCG)		
M White	Martin Ryan Institute (UCG)		

Cruise Objectives

1. to investigate water column structure on the southern Malin shelf and the nature of the Irish salinity front to the NW of Ireland.
2. to investigate the distribution of phytoplankton and zooplankton over the southern Malin shelf and in the western Irish Sea.
3. to service the DANI mooring at station S45.
4. to collect water samples from stations S 38, S45 and S50 for measurement of dissolved oxygen and particulate organic carbon in the summer stratified region of the western Irish Sea.

Cruise Narrative

RV Lough Foyle departed Belfast at 0800 on Monday August 5 and sailed for Station M1 (Figure 1). Between August 05 and 08 stations were worked in order (Figure 1) except for station M36 which was not worked. Strong SE winds prevented working stations in the North Channel during the evening of August 08. On August 09, stations S18, S27, MS21, MS20, S44, S43, S42, MS23, MS22, S26, S25, S16, M49 and M50 were worked. On Saturday August 10, stations M51, M48, M47 and M01 were worked before Lough Foyle returned to Belfast, docking at 0800 for a mid cruise break and change of scientific personnel.

August 12. Stations S38 (53.85 05.57) and 50 (53.62 05.47) together with the remaining survey stations (S24, S47, MS17, MS18 and MS19) were worked on Tuesday August 13. Lough Foyle docked in Belfast on Wednesday August 14 at 0800.

Preliminary Results

Surface distributions of temperature and salinity to the north of Ireland are shown in Figure 2A and B. A feature of the thermohaline field is a salinity front which runs SW-NE along the shelf in this region and separates coastal water from water of more oceanic characteristics. This is the northern section of the Irish Shelf Front which runs along the entire west coast of Ireland following the 150 m isobath and whose surface signature can be defined by the 35.3 isohaline. The Irish Shelf Front is a Type I or 'surface to bottom' front distinct from the Type II or tidal fronts which separate tidally mixed water from thermally stratified water. Until relatively recently the Islay Front was considered a Type II front and evidence of its presence can be seen in the 2 °C change in surface temperature that occurred over a short horizontal distance to the northwest of Rathlin Island (Figure 2A). It is now known, however, that the Islay Front is a mixture of a Type I and Type II fronts and from the surface salinity distribution it would appear that the Irish Shelf Front is subsumed into the Islay Front to the north of Malin Head. There is a seasonal east-west separation in the Type I and Type II components of the Islay Front which is greatest in summer with the Type I (salinity) component found to the west, as was observed during this cruise.

A vertical section of salinity from station M18 to M26 is shown in Figure 3. This section which crosses the continental shelf shows evidence of the intrusion of high salinity water onto the shelf. The highest salinity was measured below 100 m at the shelf edge is a signature of the poleward flowing shelf edge current. At this latitude the core of the current is thought to be at about 400 m depth.

The surface to bottom characteristic of the Irish shelf front is shown in Figure 4, a section running North - South between station M35 and M18. One feature observed which has not been previously documented is an intrusion towards the coastline of high salinity oceanic water above the pycnocline. This feature may be the result of surface wind driven flow due to southerly winds prior to and during the cruise.

Initial observations suggest that there was a high abundance of *Calanus finmarchicus* between the Irish coastal front and the edge of the shelf. Numbers of *Calanus* were much lower in the North Channel and western Irish Sea.

Problems Encountered

At station M25 the bottle firing mechanism of the rosette sampler failed. This prevented the collection of water samples for measurement of dissolved inorganic nutrients and phytoplankton chlorophyll for the remainder of the cruise. However, samples were collected from the ships pumped clean seawater supply for dissolved nutrients, phytoplankton chlorophyll and phytoplankton species composition and abundance.

Acknowledgments

I would like to thank the scientific staff, Captain A. Niblock and his officers and crew for their help during the cruise.

R. Gowen, AESD



September 10, 1996

FIGURE 1. A map of the southern Malin Shelf and western Irish Sea showing the position of sampling stations worked during Lough Foyle cruise LF3296.

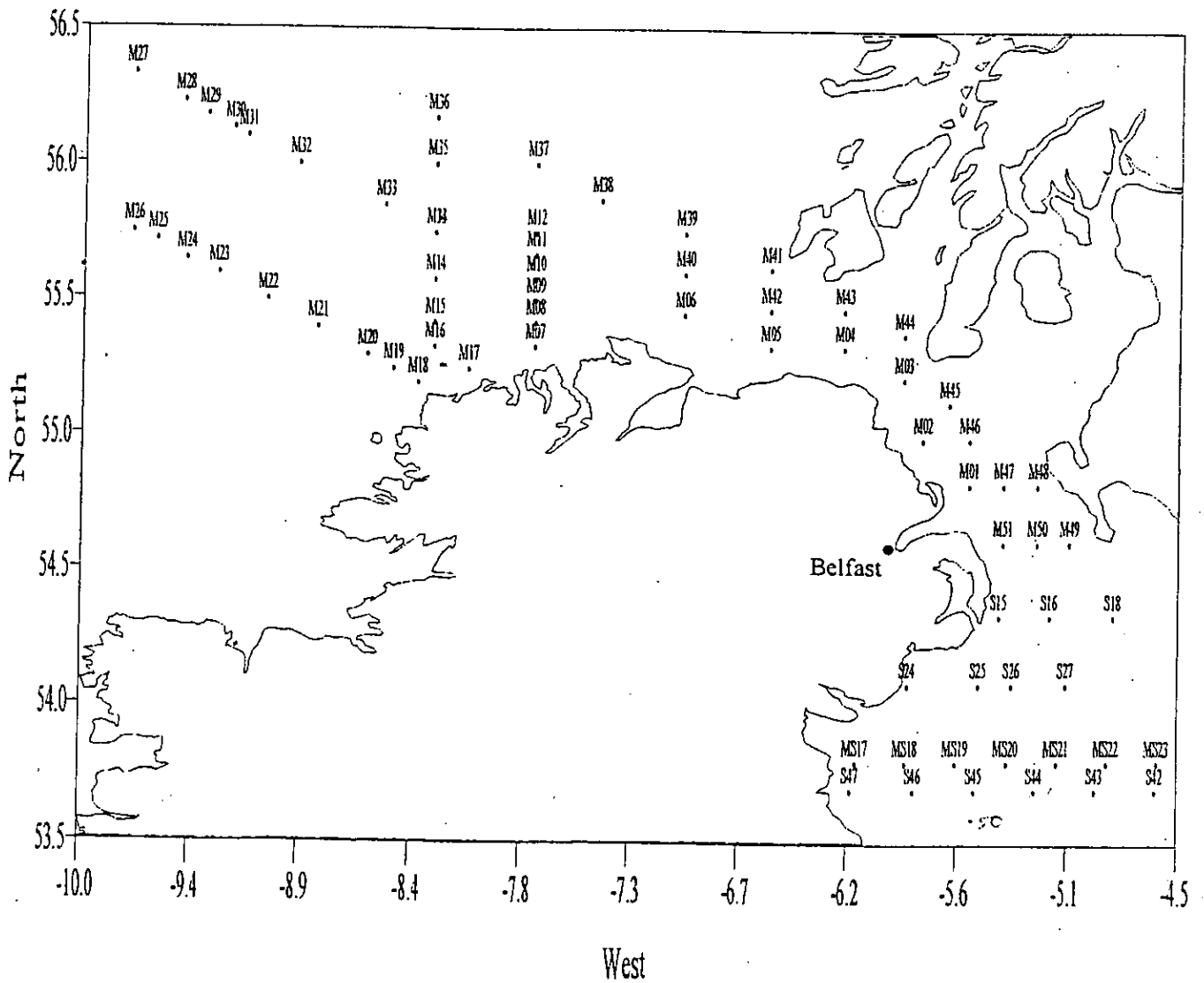
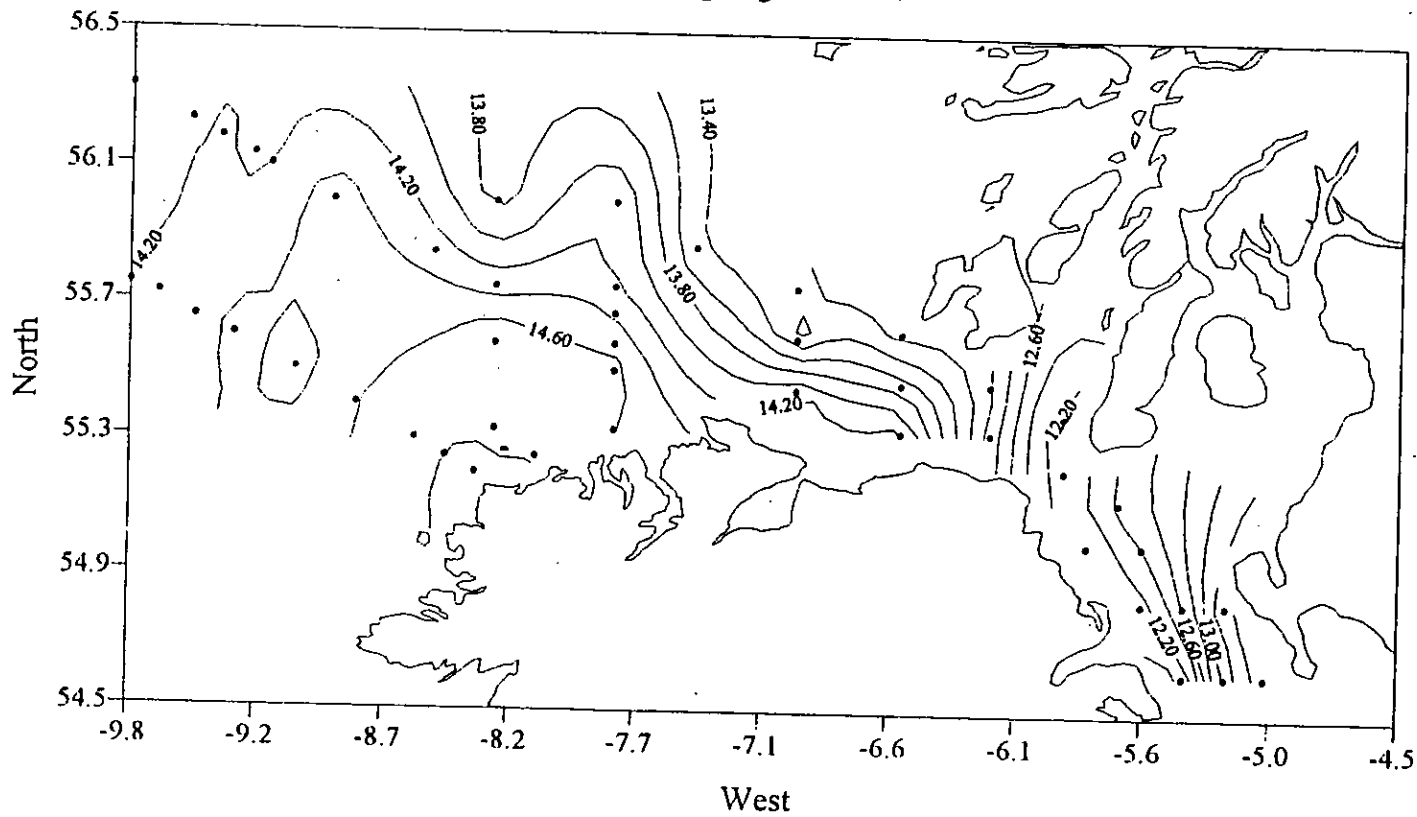
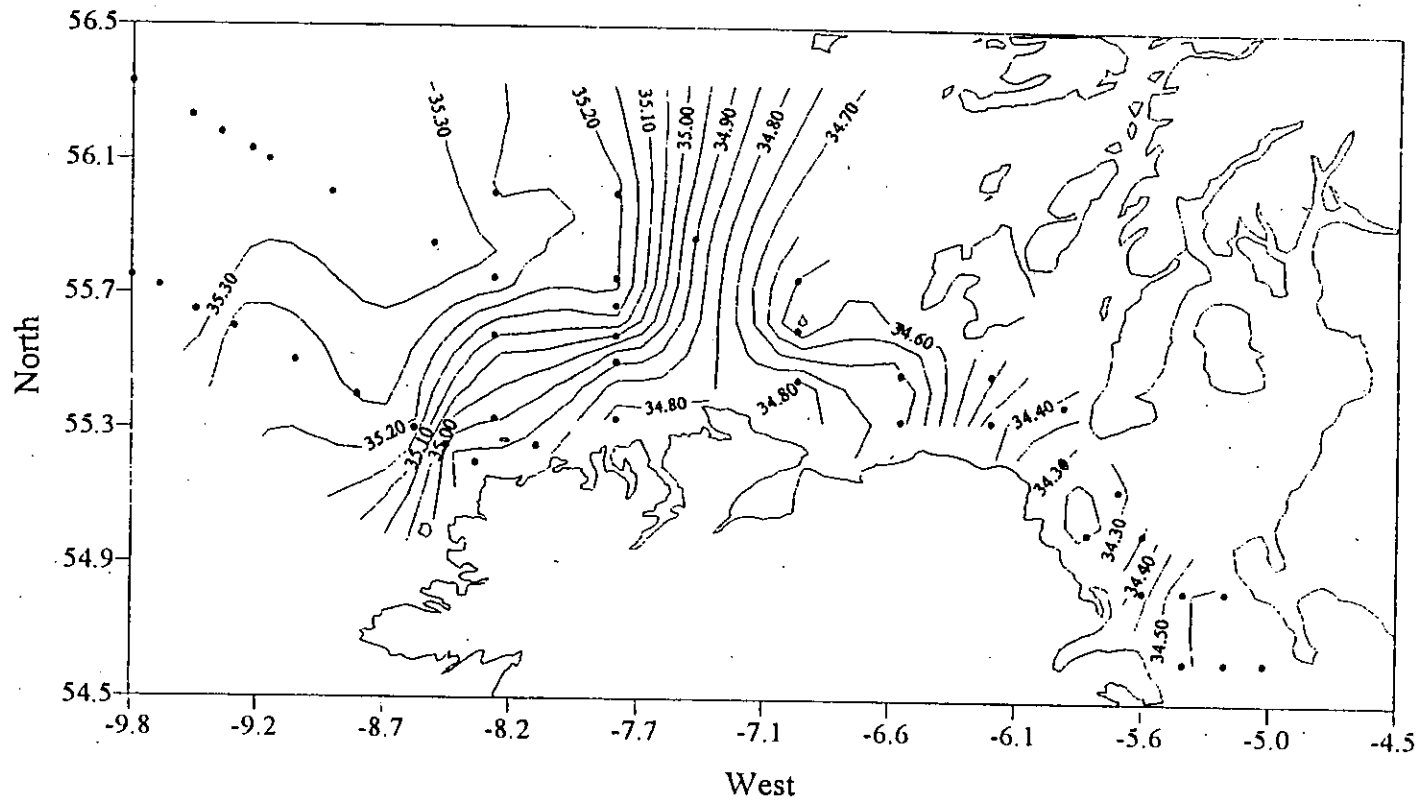


Figure 2A. The distribution of near surface water temperature in the southern Malin Shelf and North Channel during August 05 - 09.



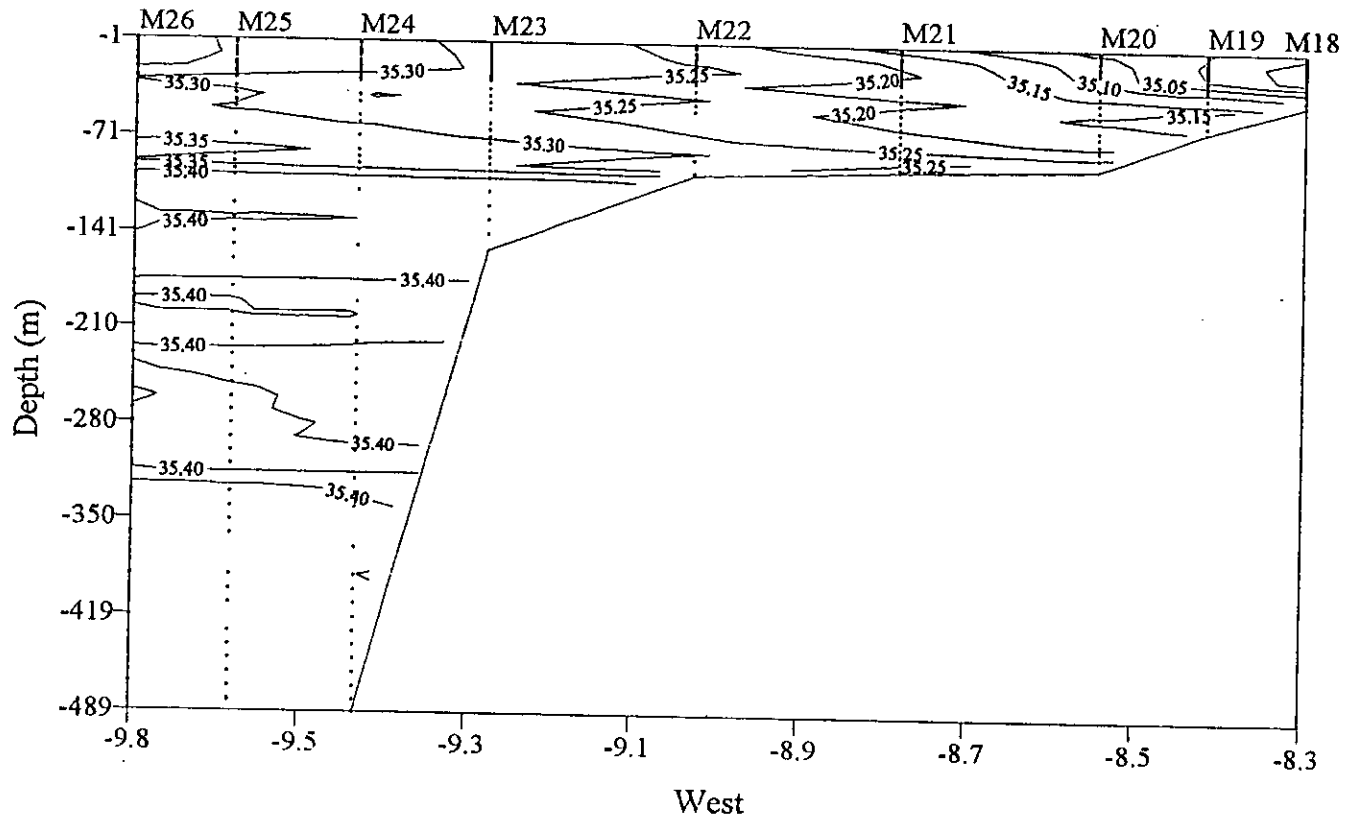
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Figure 2B. The distribution of near surface salinity in the southern Malin Shelf and North Channel during August 05 - 09.



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Figure 3. The vertical distribution of salinity along a section from station M18 to M26.



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Figure 4. The vertical distribution of salinity along a section from station M18 to M35.

