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Lough Foyle Cruise Report LF 3198
Evaluation of u-tow Phytoplankton Sampler
27-31 July

2. Dr Mc Murray.
The sea trials of this new oceanographic equipment went exceptionally well. Not only did the trials go well but the quality of data obtained surpassed that of previous surveys & allowed new oceanographic features to be observed. When completed the data from the cruise & other associated cruises should provide a valuable supplement to the other ongoing DAN1 projects.
From 7/8

Personnel

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Cruise Objectives

1. To perform trials and sea acceptance test with new u-tow designed to sample microplankton.
2. To develop parameterisation necessary to write conditional sampling software.
3. To collect zooplankton samples using the plankton sampling mechanism in the u-tow and vertical bongo net hauls.

Cruise narrative

Scientific personnel assembled on the RV Lough Foyle on the evening of 26 July. A safety drill was undertaken by the ship's master.

On 27 July the ship sailed, arriving off the Copeland Islands where a CTD profile was taken at c. 09.30 h. The u-tow was then deployed and the ship sailed south, keeping outside the 50 m depth contour line with u-tow undulating between about 3 and 40 m. Water samples were collected by the u-tow on passage. During the tow the vehicle was recovered and the bridle moved further back, enabling undulations down to 50 m depth to be made. A track between the Copeland Islands to station 38 a was undertaken. On this run the u-tow functioned very well and at 8 knots a vertical profile was made within the stratified gyre region collecting water samples at discrete depths of 7, 25 and 38 m. In the later stages it was discovered that the bags in the u-tow were failing to fill. The Aquamonitor was dismantled and the flapper valve repaired. The ship anchored overnight off Drogheda.

On 28 July work commenced with a CTD profile at Stn 49, off Drogheda. The u-tow was deployed but accidentally hit the bottom. It was recovered without damage, cleaned and redeployed at c. 09.10 h. The ship made way to stn 38a, arriving at 11.15 h. A CTD profile was made and sediment core samples and bongo net hauls taken. The u-tow was recovered and on checking was found not to have filled the bags properly due to sediment having blocked the Aquamonitor. This was removed, cleaned and the u-tow redeployed. The tow to Liverpool bay was completed with CTD profiles and water samples collected at 5 stations:

During passage the fluorometer of the u-tow was calibrated using water samples, filtered and extracted in acetone. The ship anchored in Liverpool Bay overnight.

A new course was followed on 29 July from Station 9 in Liverpool Bay to near Ardglass, Co Down, passing just south of the Isle of Man. Only three CTD profiles were taken with bongo net hauls but water samples and zooplankton samples were collected by the u-tow along the route. On the second half of the tow from the Isle of Man to Ardglass the bags of the Aquamonitor again failed to fill. This was traced to a software fault which had arisen as a result of the stopper motor on the piston driver of the sampler having been upgraded. The fault was corrected and the ship made its way to north of the Maidens Rocks overnight.

On 30 July the ship followed a route from the Maidens Rock, north of Rathlin Island and to the banks north of Malin Head. Because of uncertain weather conditions, CTD casts were not made en route, but water and zooplankton samples were collected by the u-tow. This was the longest continuous tow (> 12 hours) made to date with this instrumentation.

The ship returned to Belfast on the morning of 31 July.

Provisional Results

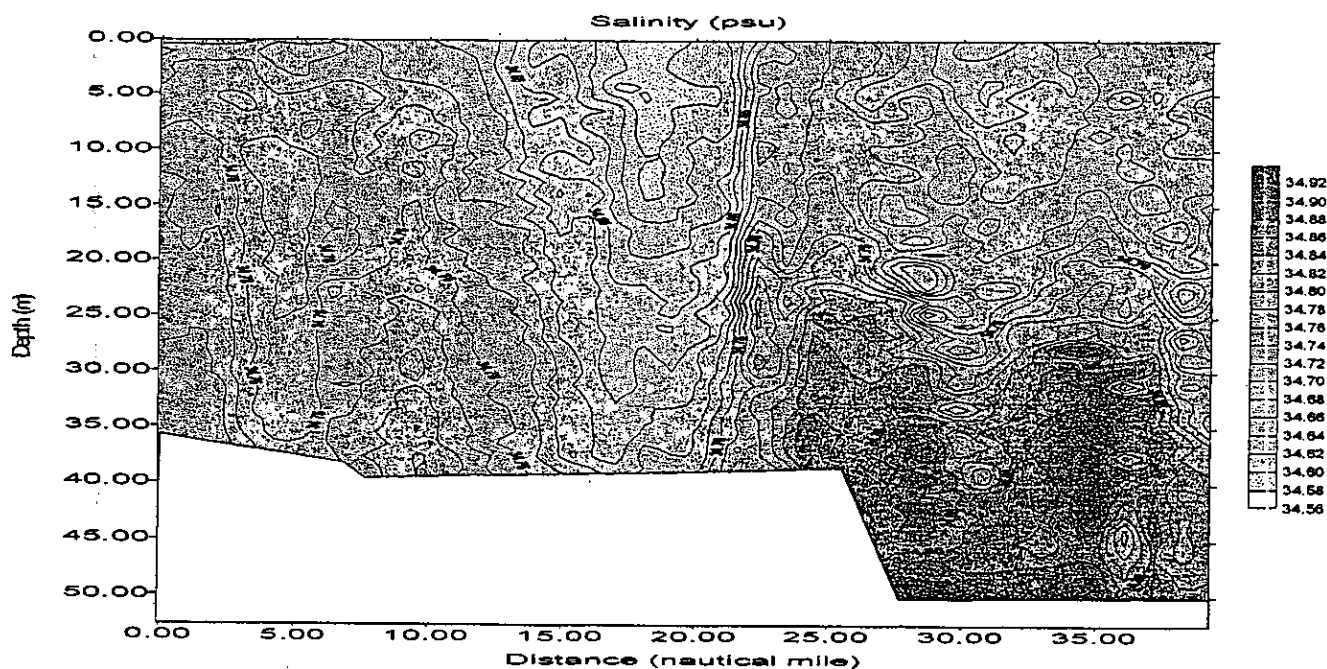
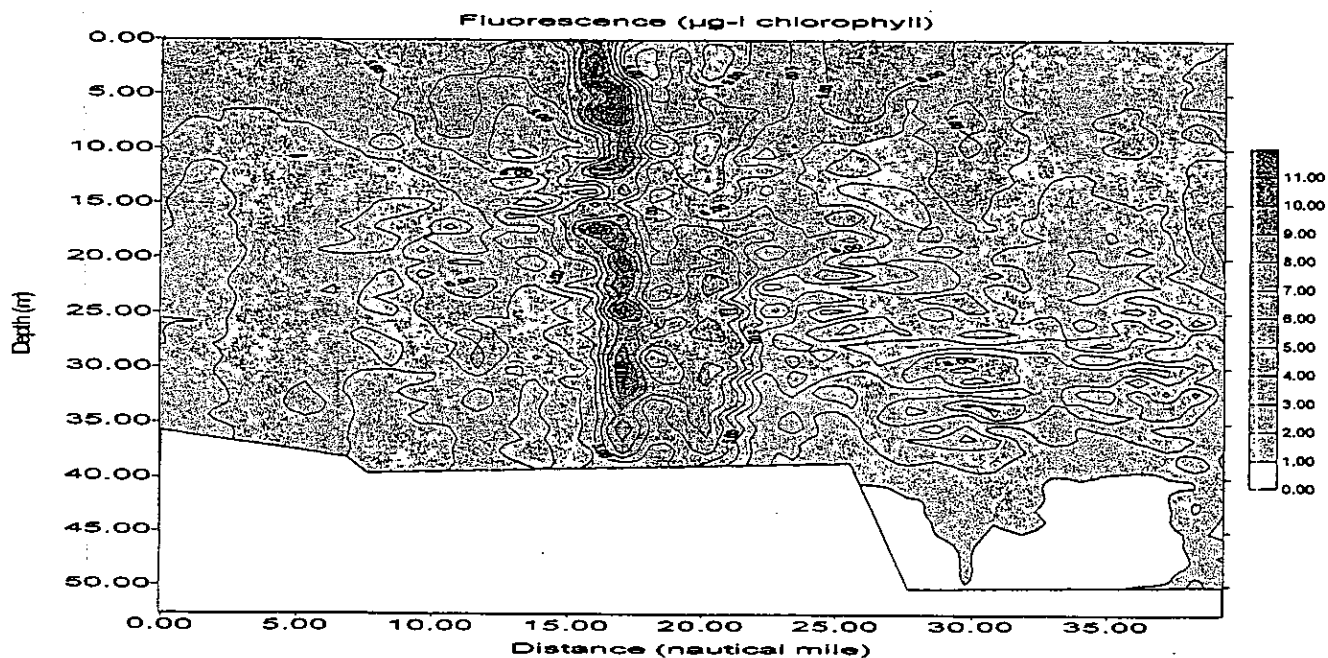
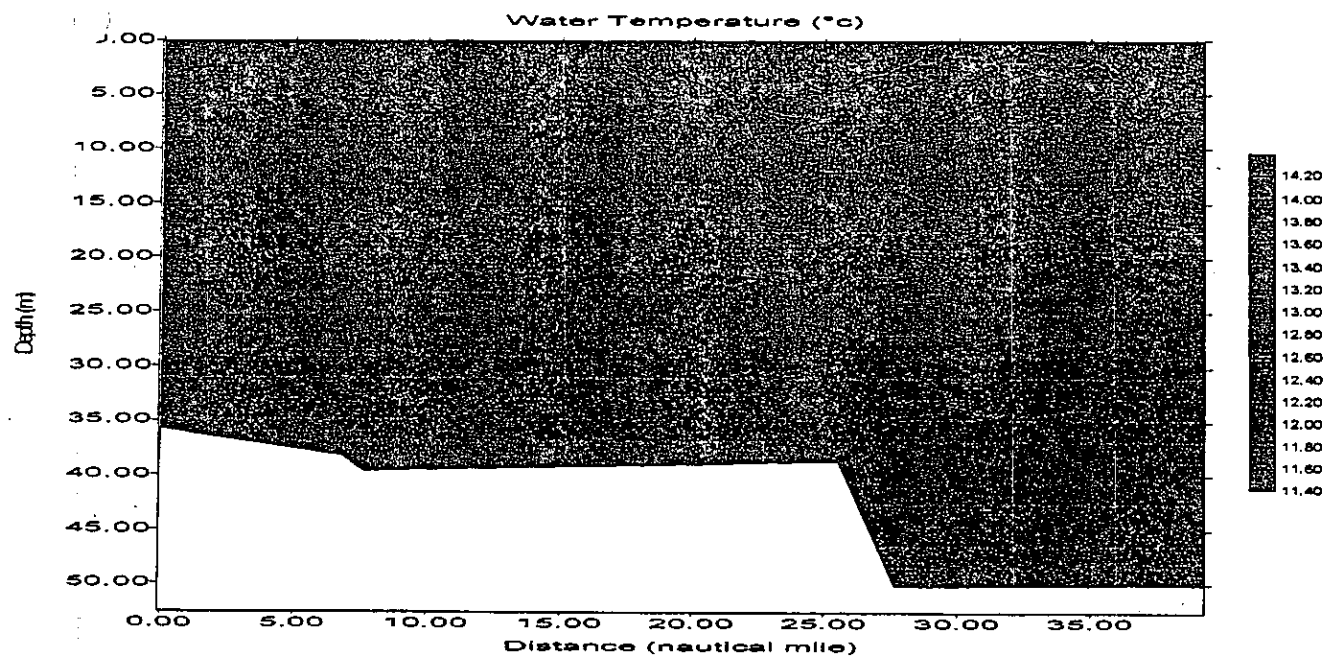
The attached figure shows results of temperature, salinity and concentration of chlorophyll a between the Copeland Islands and Drogheda. This is a high resolution picture and the outcome of some 300 vertical sections whilst the ship was steaming at 8 knots. A frontal region of high plant biomass is clearly seen. Similar zones were also present on other legs of the cruise. What is new is that these features of both horizontal and vertical structure can now be sampled for water samples without need to stop the ship, considerably increasing efficiency and effectiveness.

Transect sample line: 28.7.98. u-tow

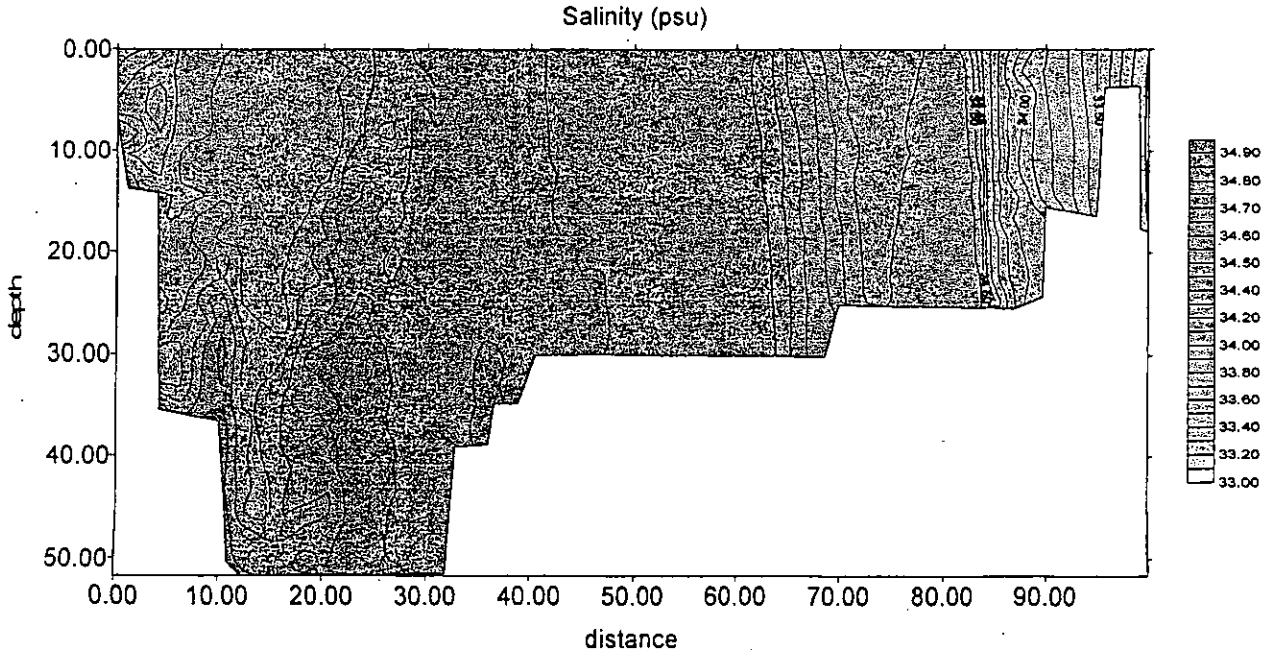
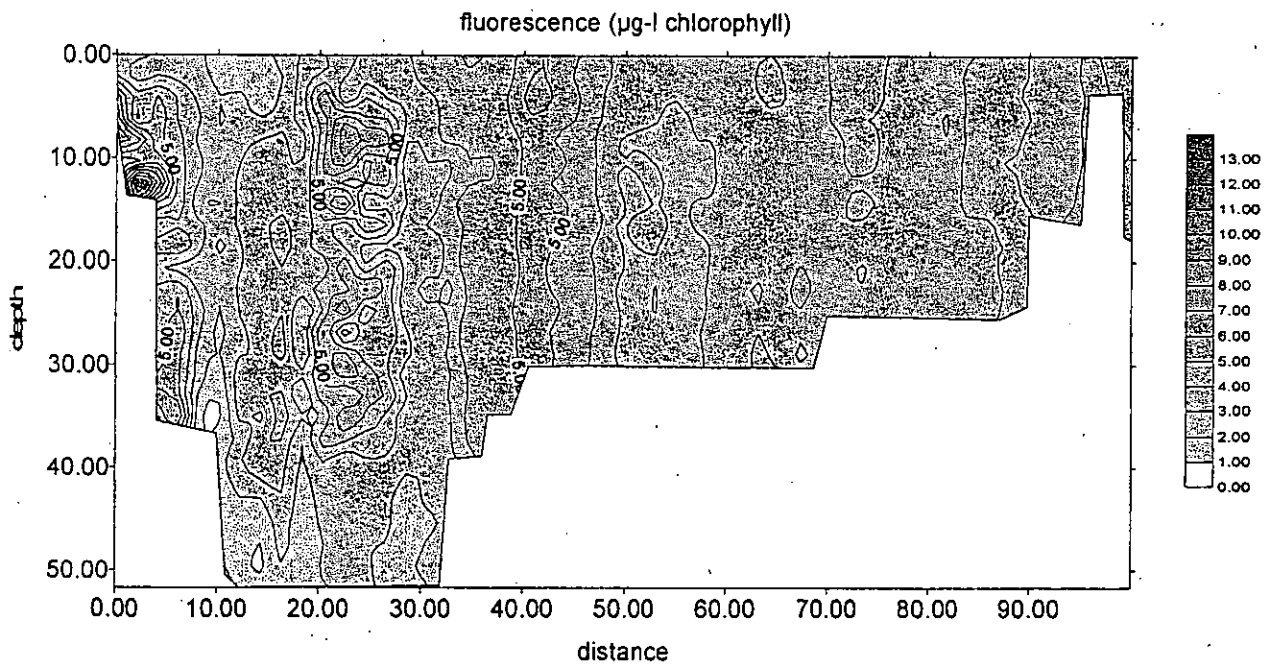
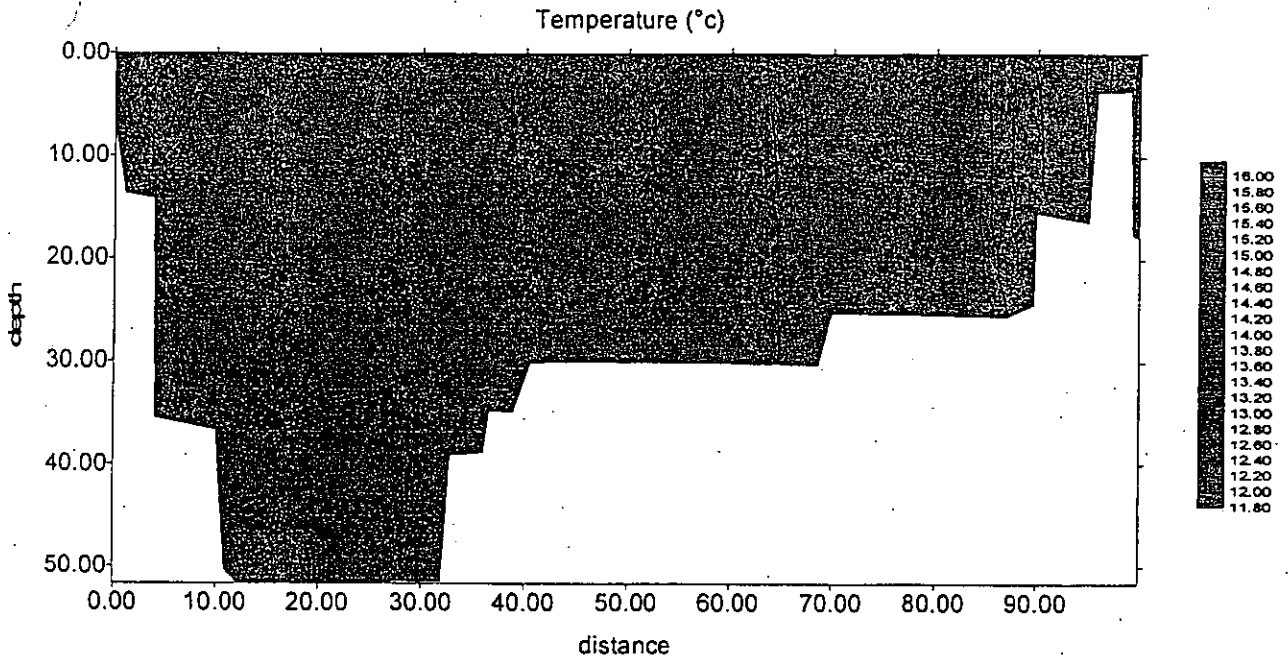
*Stn 49	53.43 N	06.09 W
1.	54.45 N	05.54.97 W
*Stn 38a	53.47 N	05.38 W
2.	53.45 N	05.21.96 W
*3.	53.42.69 N	05.05.36 W
4.	53.40.17 N	04.49.06 W
5.	53.37.95 N	04.32.25 W
*6.	53.35.60 N	04.16.95 W
7.	53.33.02 N	03.59.35 W
8.	53.30.67 N	03.43.05 W
*9.	53.27.96 N	03.24.94 W

*CTD profiles and Bongo net hauls made

Profiles for tow from North Channel southwards, Irish Sea 27 July 1998
(blanked portion represents limit of information, not sea bed)



Profiles for tow across Irish Sea from Drogheda to Liverpool Bay
 28 July 1998 (blanked portion represents limit of information, not sea bed)



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