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Charter Cruise FRV *Lough Foyle*

0046H

REPORT

Cruise 7/91, 12-19 July 1991

Personnel

M Heath	PSO (in charge)
C Hall	SSO (12-15 July)
S Forbes	SSO (15-19 July)
R Payne	HSO (12-15 July)
J McKie	HSO
E Macdonald	SO
S Heaney	ASO
J Hunter	PTO
P Brennan	Student (15-19 July)
D Plummer	Visitor (Plymouth Marine Laboratory)

Objectives

1. To deploy and service instruments on moorings in Loch Linnhe.
2. To carry out a programme of physical, chemical and biological sampling in Loch Linnhe

Narrative

The vessel sailed from Oban at 1515 on 12 July, and completed all moored instrument recovery work and ARIES tows before the staff change over on 15 July, which took place in Oban. During the second part of the cruise, further fixed station sampling was carried out, together with an acoustic/surface towed CTD survey. During 16-18 July, a 24 h sampling programme was carried out in the inner basin of Loch Linnhe, and finally, MIKT trawl sampling was undertaken at a series of stations on 18 July. The vessel docked in Oban at 0800 on 19 July.

Results

All the moored instruments were safely recovered and new units deployed in their place. The data from the moored nitrate analysers indicated persistent low concentrations throughout the deployment period in the surface waters, and slightly higher levels in the deep layers. Chlorophyll fluorescence represented concentration between 2-5 mg/m³ throughout.

The samples collected with ARIES indicated significantly lower concentrations of zooplankton than during the spring cruises, especially in the outer part of the loch. Collections of live material for ammonia excretion measurements yielded comparatively few specimens. However, biomass of jellyfish (mainly *Aurelia*) and juvenile fish (mainly whiting) was high, and could account for the depletion of zooplankton.

Nitrate and phytoplankton chlorophyll concentrations were inversely related during the surface towed CTD survey in the outer part of the loch. The lowest nitrate levels ($<0.1 \text{ mg-at/m}^3$) were in the vicinity of the Lismore mooring. Higher nitrate, and lower chlorophyll concentrations were found in the surface waters of the Firth of Lorne and in the inner basin.

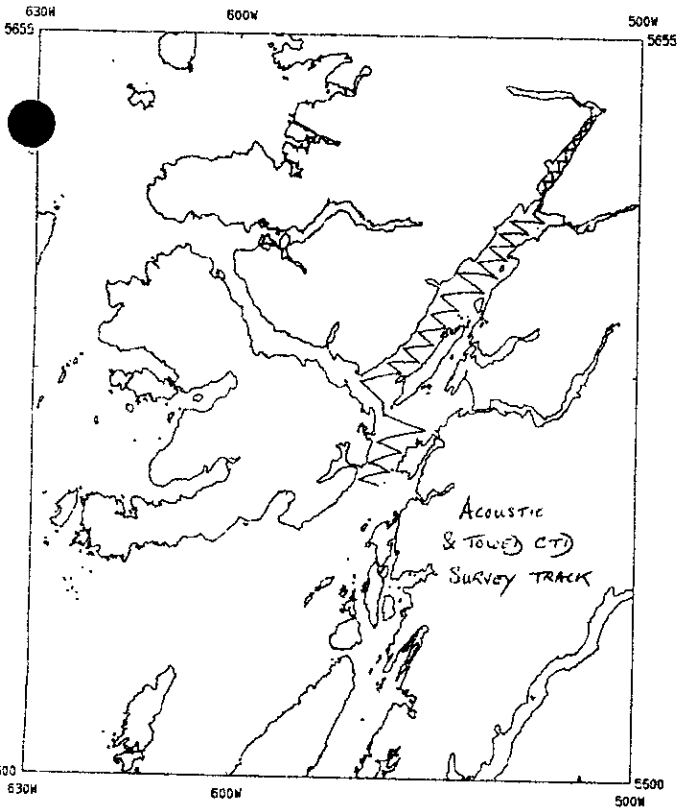
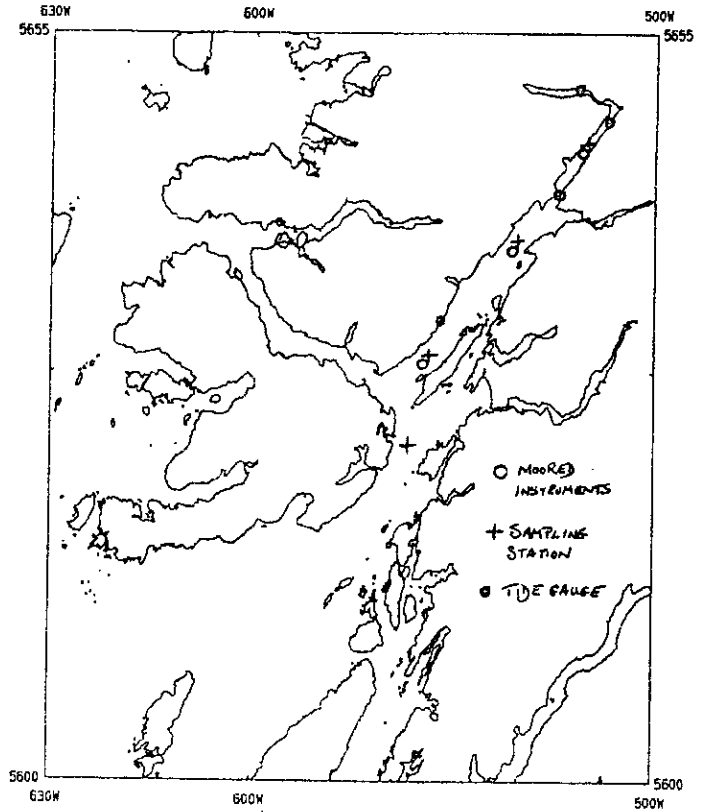
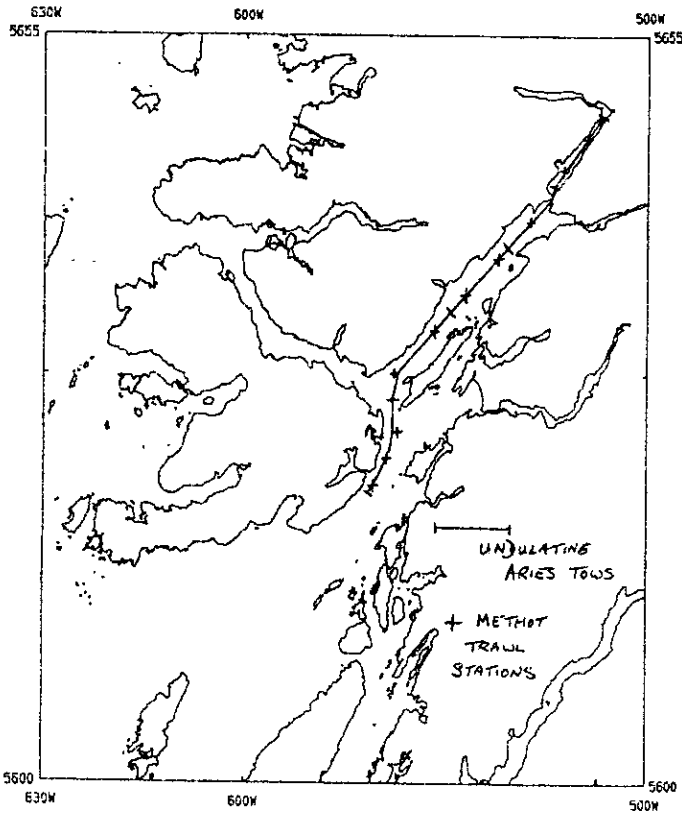
The acoustic records contained substantially denser scattering layers than in earlier surveys. The majority of scatterers were probably jellyfish, juvenile fish and euphausiids (based on MIKT catches). The acoustic data from the 24 h sampling programme in the inner basin provided an outstanding example of the diel vertical migration behaviour of a dense scattering layer (probably *Pasiphaea* and *Meganyctiphanes*).

There was good evidence of stagnation of the bottom water in the inner basin during the cruise. The deep water was colder than the overlying waters and contained higher concentrations of nitrate and ammonia. Migrating organisms observed during the 24 h programme did not descend into this bottom water.

Close communications were maintained with the NERC aircraft base during the cruise in an attempt to organise the planned overflight for collection of remote sensing data. However, the persistence of low cloud and unseasonably miserable weather prevented any possibility of an overflight.

M Heath

30 September 1991



"Lough Foyle" cruise 7/91
12-19 July 1991