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Charter Cruise FRV *Lough Foyle* H22

REPORT

Cruise 1/91

16-25 January 1991

Personnel

M Heath	PSO (in charge)
C Hall	SSO
R Mitchell	SSO
J Pirie	SSO
P Copland	HSO (21-25 January)
J Dunn	HSO
S Hay	HSO
R Payne	HSO (16-21 January)
C Stewart	Ind Tech (16-29 January)
A Rees	Visitor (Plymouth Marine Laboratory (19-25 January)

Objectives

1. To deploy instruments on moorings in Loch Linnhe.

2. To carry out a programme of physical, chemical and biological sampling in Loch Linnhe.

Narrative

Scientific equipment was loaded in Oban on 16 January. The following day the vessel proceeded to Fort William where a tide gauge was deployed beneath the pier. The vessel then tied up fore and aft to a two-point mooring (I) previously installed by a contractor in the upper basin of Loch Linnhe. Installation of instruments commenced, but close to completion of the operation it became clear that the bow mooring was dragging. The fore and aft mooring ropes then became tangled and snagged the partially deployed instrument line. During attempts to recover the instruments the line parted and half of the instruments were lost. At about the same time it was found that a rope had fouled the ship's propeller. With some difficulty, the aft mooring ropes were transferred to the bows, and the ship lay to the damaged mooring overnight.

The following morning, divers from Fort William cut away the fouled rope on the propeller, which proved to be an abandoned gill net, not connected with the mooring operations. The vessel then made a passage for Oban but was unable to dock due to lack of available space, and bad weather prevented access to Dunstaffnage Bay. The vessel therefore dodged offshore overnight.

Following staff change in Oban on the morning of 19 January, the vessel tied up to the mooring off Lismore (IV) which was of a different design to that in the Upper Basin. This mooring showed no sign of dragging despite a 30 kn wind, so installation of instruments proceeded and was satisfactorily completed. During the following four days, sampling was carried out at four fixed locations, and series of ARIES and Methot-net tows along the axis of Loch Linnhe were carried out.

During the afternoon and night of 23 January an acoustic and surface (3 m) towed CTD survey was carried out. The acoustic survey was replicated during the morning of 24 January, and following calibration of acoustic transducers at anchor, the vessel docked in Oban at 0830 on 25 January.

Results

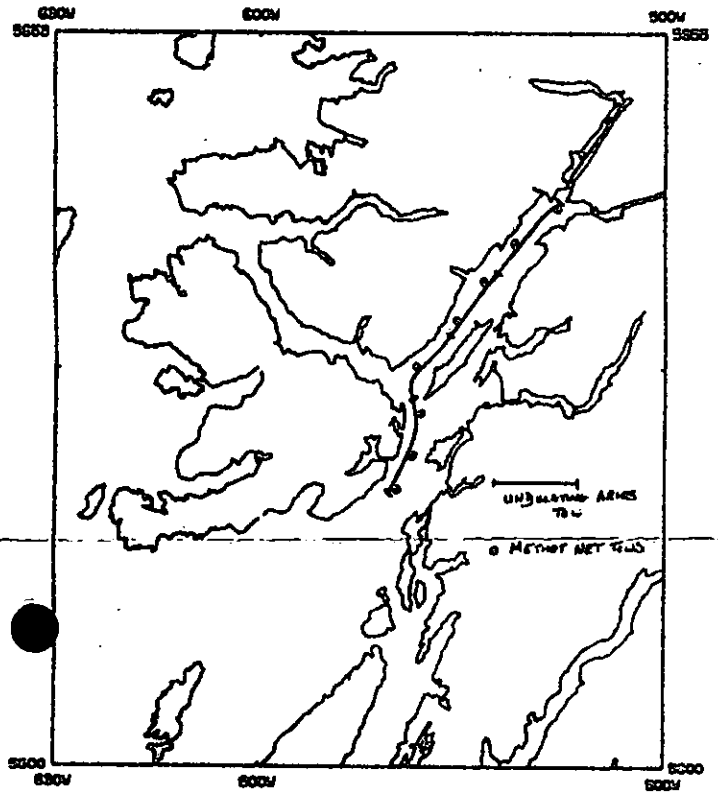
The failure of the two-point mooring system installed by a contractor prior to the cruise and loss of instruments was a considerable disappointment. Fortunately, the instruments were recovered intact on 22 January by the contractor and returned to the vessel. Negotiations to redeploy the unsatisfactory moorings were initiated during the cruise.

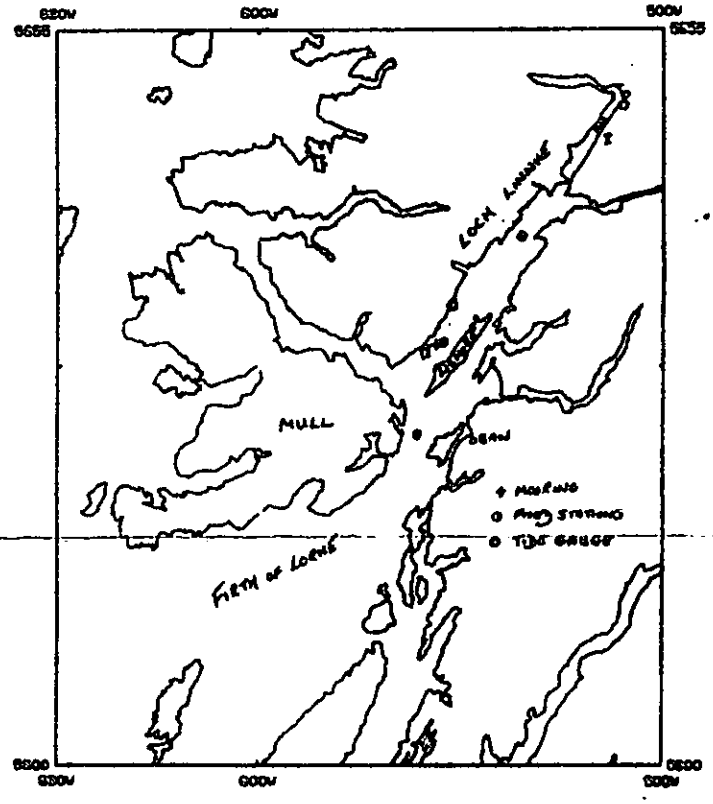
The mooring at Lismore was of a single-point design, and proved to be adequate for the job. This is the most important mooring for the project and was successfully fitted with instruments (two current meters, two fluorometers, two transmissometers, two nitrate analysers and a thermistor chain).

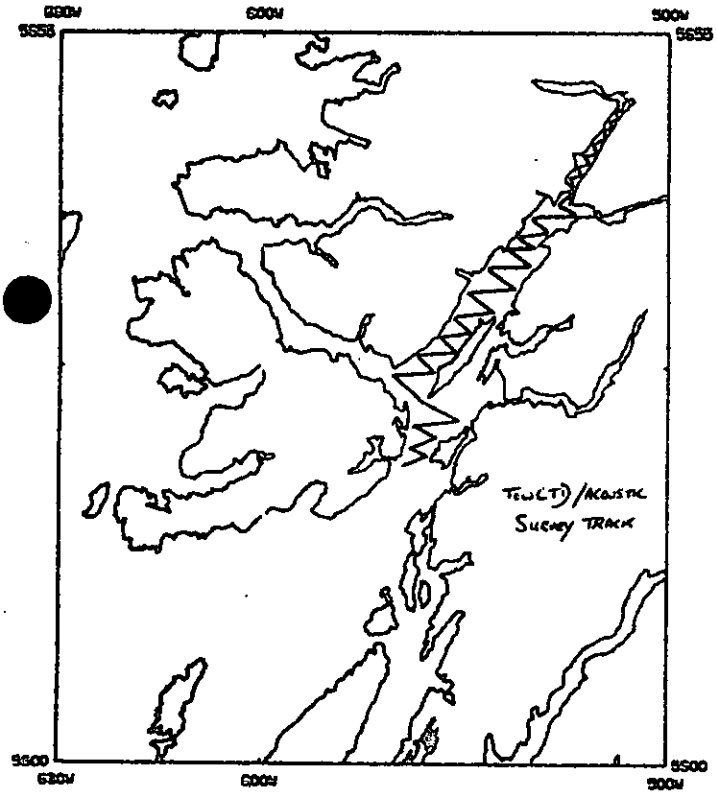
ARIES and the new optical plankton counter performed well during the cruise, and a near-complete section along the axis of the loch was completed by a series of undulating tow deployments. Initial examination of the data indicated a thick (10-15 m thick) layer of low salinity (<25 ppt) water at the surface of the loch, which contained few zooplankton. Zooplankton, including euphausiids, were present in the deeper layers, and replicated ammonia excretion rate measurements were carried out on live specimens at each of the fixed sampling positions. At the same time, measurements of primary production and inorganic nitrogen assimilation by phytoplankton were carried out on water samples from the surface layers.

The surface towed CTD survey indicated a strong cross-loch gradient in salinity, nitrate and temperature in the inner basin. The boundary between low salinity water on the eastern shore of the loch and higher salinity on the west was marked by a pronounced foam line. In the outer basin, cross-loch gradients were less pronounced. The acoustic surveying indicated numerous areas of echos from fish or macroplankton within the sea-loch, and the Methot-net sampling confirmed the presence of euphausiids (*Meganyctiphanes*), decapods (*Pasiphaea*) and 0-group fish (mainly sprat). Numerous specimens of sprat were retained for otolith daily growth ring and RNA/DNA studies to determine fish growth rates.

M Heath
12 February 1991







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