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Charter Cruise RV *Lough Foyle*

42H

CRUISE REPORT

Cruise 3/91; 21-28 March 1991

Personnel

S Hay HSO (in charge)
J Simmonds PSO (24-25 March)
R Mitchell SSO
J Pirie SSO
J Dunn HSO (21-24 March)
R Payne HSO (21-24 March)
P Copland HSO (24-28 March)
P Rankine HSO (24-28 March)
A Matthews SO
J Hunter PTO (21-24 March)
P Brennan Student (25-28 March)
D Plummer Visitor from PML

Objectives

1. To lift, service and redeploy moored instruments in Loch Linnhe.
2. To carry out a programme of physical, chemical and biological sampling in Loch Linnhe.

Narrative

The scientific equipment was loaded at Oban on 21 March and the ship sailed at 1530 towards the mooring site in Inner Loch Linnhe. After calibration sampling, the mooring was recovered during the morning of 22 March although the recovery was delayed for about an hour after the ship reversed into the mooring pick-up rope. While awaiting a diver from the Fort William Dive Centre to free the propeller the moored instruments were recovered. The tide gauge installed at the Dive Centre was recovered while collecting the diver in the inflatable boat. Despite some manoeuvring difficulties the moored instruments were rigged and re-deployed and a thermistor chain lifted by mid afternoon. A problem integrating the ship's echosounder to our navigation and data logging system rendered deployment of the ARIES sampler too risky while restriction of passage times through the Corran Narrows to times near slack tide meant that Methot net sampling had to be commenced at the head of the Outer Loch. Stations 3-8 were worked for the rest of the day.

Coring and water sampling at the Lismore mooring site commenced at 0100 on 23 March and continued until dawn. Adverse wind and tide forced a delay in recovering the Lismore mooring so the ship proceeded to the Outer Loch mooring site and recovered and re-deployed the current meters and settlement trap there. Calibration sampling was performed and the ship returned to the Lismore site. The Lismore mooring was lifted and re-layed without instruments since these were not all ready for re-deployment. A thermistor chain was lifted and replaced, the tide gauge at Glen Sanda lifted and replaced and instrument casts were made at the Lismore site. The re-laying of the Lismore moored instruments was rescheduled until the following morning and the ship proceeded into the Firth of Lorne to sample Methot stations 9 and 10.

The Lismore mooring was re-deployed at dawn on 24 March. After calibration sampling the ship carried out a short tow with the surface sampling CTD system across the seaward end of Outer Loch Linnhe. A short steam was made to Dunstaffnage to exchange staff. With some rewiring we were able to link the laboratory echosounder to the navigation and instrument logging gear and, using a towed transducer, input depth data. This enabled a deployment of the ARIES sampler in the Outer Loch which was followed by passage through the Narrows and effecting the last two Methot net tows during the evening. Throughout the afternoon, evening and following morning, J Simmonds and P Copland attempted to trace the source of signal noise which had corrupted 200 KHz echosounder data from previous trips. This met with limited success since the noise was not very apparent at the time.

Coring, water sampling and experimental work at the Inner Loch mooring site commenced at 0100 on 25 March. During the morning a thermistor chain was re-laid and a series of steams at various speeds were used to test the echosounding gear. J Simmonds was put ashore at the Fort William Dive Centre and P Brennan replaced him at mid-day. Also, the tide gauge was reinstalled at this site. Three separate undulating deployments of the ARIES sampler were made from Fort William down the Loch to Lismore. These were all successful and completed by 2200.

Coring, water sampling and experimental work commenced at the Firth of Lorne station at 0100 on 26 March. With the sampling for this station complete by 1000, a fast steam was made to Fort William and the zig-zag survey track with towed surface CTD, pumped water sampling, optical plankton counter and echosounders was carried out from Fort William (1300) to the Firth of Lorne (2200). Since the noise problems with the 200 KHz sounder had re-appeared, a 120 KHz sounder was used along-side the 38 KHz sounder and there were no problems with this machine although using the 120 KHz meant much poorer data resolution.

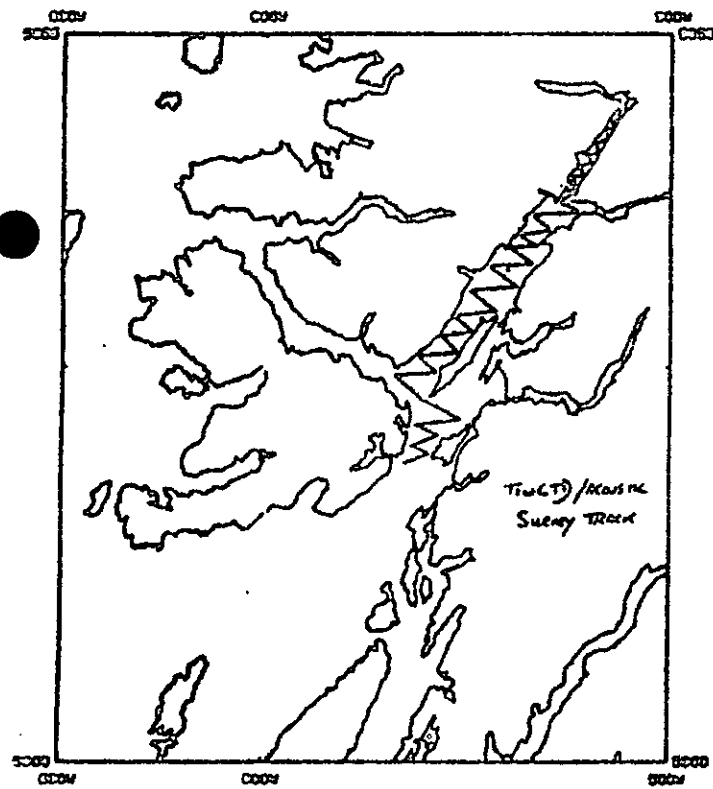
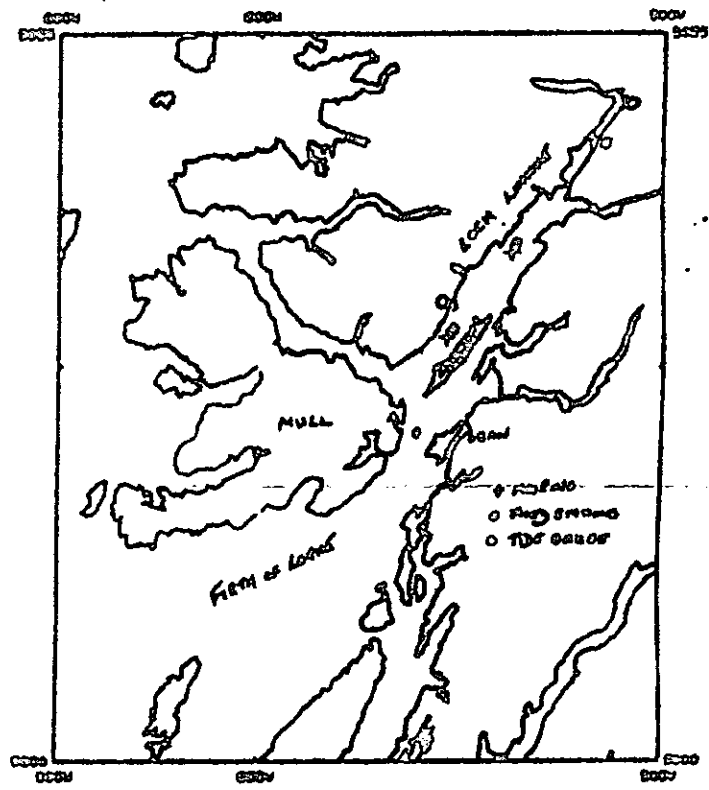
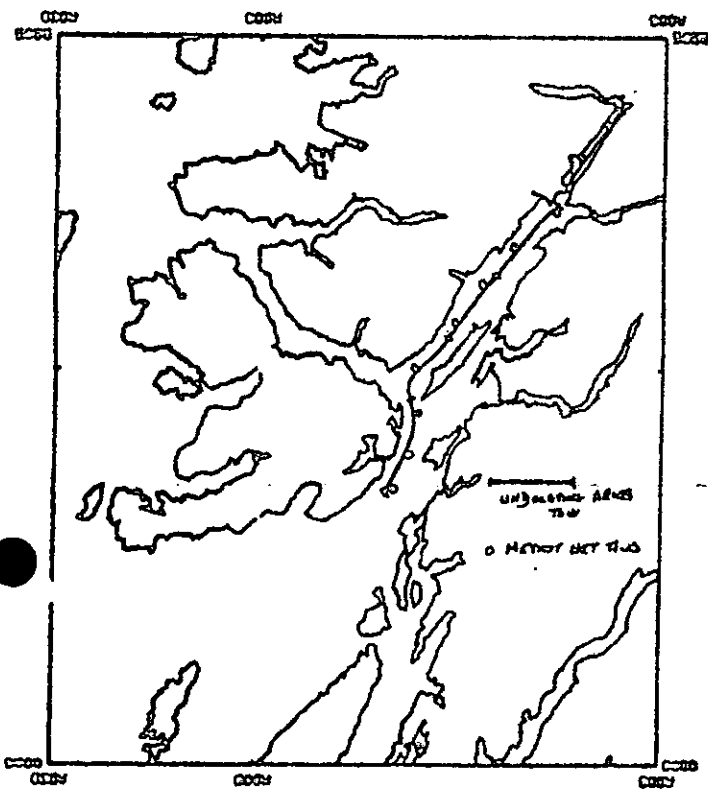
The last coring and fixed position water sampling and experimental station was begun at 0100 on 27 March at the Outer Loch Linnhe mooring position and sampling was completed by 0900. The ship then proceeded to the Firth of Lorne where the last two ARIES tows were completed by 1430. Some time was then spent doing echosounder runs in the Firth of Lorne before anchoring in a sheltered bay to calibrate the echosounders during the evening and early morning. During the afternoon and evening

all the gear was repacked ready for unloading. The ship docked at 0830 on 28 March at Oban and despite some problems in finding deep enough water to berth without grounding, all equipment and personnel were offloaded by 1030.

Results

Despite a number of operational difficulties the major survey objectives were all achieved. All moored instruments were lifted, serviced and re-deployed. The majority of the instruments had worked well during the past month although there were some losses due to pressure casing failures and flooding. Sampling down the axis of the loch system, ten large-mesh Methot net tows, a complete series of undulating ARIES tows and four, fixed, vertical sampling stations were done. Also at the fixed stations, live material was collected and experimental incubations performed to measure phytoplankton primary production and nitrogen assimilation, and zooplankton excretion and microzooplankton grazing. A wide coverage (zig-zag) survey with the towed CTD/optical plankton counter system was also carried out successfully. During this, continuous dual frequency echosounding was carried out and pumped surface water sampled to give continuous nitrate analysis and calibration sampling for the towed instruments. Very preliminary analysis of the data indicate a turbid, low salinity surface layer within the loch system and a non uniform distribution of this low salinity water across the loch. Nitrate levels were high, phytoplankton was not abundant and the spring bloom had apparently not begun. Zooplankton were moderately abundant in the Firth of Lorne becoming less abundant within the loch system and with considerable numbers of *Pasiphaea* and *Meganocytiphanes* in the deeper waters of the Loch. Larval fish were beginning to appear in the samples as were *Scyphomedusan ephyrae*.

S J Hay
23 May 1991



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21-28 March 1991