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FRV *Clupea*

Cruise 0392C

REPORT

24 February-7 March 1992

Personnel

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Objectives

1. To measure the flow distribution and efficiency of a Methot sampling net.
2. To carry out engineering trials on a new dual-net mini-Methot sampler.
3. To conduct instrumented trials with a standard Gulf 3 sampler.
4. To carry out trials and development of the Seamatrix through-water command and telemetry system for multi-net samplers.
5. To calibrate speed logs, load cells and depth meters.
6. To evaluate the Trackpoint 2 system and to integrate it with surface navigation equipment.
7. To carry out trials with the SRD cod-end diameter measuring system.
8. To obtain water samples and core samples for the PSP monitoring programme.

Narrative

Gear and equipment were loaded at Fraserburgh on 24 February. After the electronic equipment and other instruments had been unpacked and set up in the two laboratories the ship sailed for Orkney, steaming overnight and arriving at North Sound early the following morning.

Work began immediately in poor conditions which made it necessary to seek the shelter of land and work mostly in fairly shallow waters. Poor weather persisted and one day was lost due to severe gales before *Clupea* sailed for Kirkwall on 2 March.

Further trials were carried out in Shapinsay Sound on 3 March before returning to Kirkwall in order to set up two Decca Trisponder shore stations at Scapa Flow on the morning of 4 March. In the afternoon, *Clupea* made passage from Kirkwall to Scapa Flow where the work requiring the Trisponder system was carried out before putting in at Stromness to dismantle and collect the shore equipment early on 6 March. Further trials were conducted in the Flow before exiting via Cantick Head and heading for Scrabster where the cruise finished.

Results

1. Work on the Methot net was completed by repeating some of the earlier work with identical flow meters inside and outside the net. Analysis continues, but it appears that flow into the net is closer to the unrestricted flow than was originally indicated.
2. The dual mini-Methot deployed and towed satisfactorily but problems with the mechanical operation made it difficult to fully test the electronics. The difficulties were, however, clearly identified. They have now been dealt with and the sampler has been used successfully on a subsequent *Scotia* cruise.
3. A standard Gulf 3 sampler was used to calibrate and compare a number of Marine Laboratory (MLA) flow meters mounted, in turn, in the normal position inside the nose. Only one of the four MLA flowmeters tested calibrated satisfactorily. The others suffered various mechanical problems which resulted in seriously erroneous readings on at least one of the two legs of the calibration. A calibrated flowmeter mounted externally was used during these trials to measure towing speed and provide a different basis for flow calibration.

On one tow, an identical flowmeter was used to measure the reduced internal velocity in the large diameter section of the sampler.

A new modified Chelsea CTD logger package for mackerel surveys was mounted on the Gulf 3 and successfully tested on two tows.

4. Further modifications and trials were carried out on the Seamatrix system in order to overcome the loss of signal during hauling but realistic tows were not possible because weather conditions prevented any work in the deeper waters of the Pentland Firth as planned.
5. Two net speed logs were calibrated and a new electromagnetic towed log was tested and compared with a standard propeller log which it is designed to replace.

The depth indication from a Scanmar net monitor was compared with a standard depth meter previously calibrated in the Laboratory. The readings differed by less than 1 m at depths up to 40 m.

6. Trackpoint 2 was found to give a reliable maximum operation range of about 1,800 m using a 22 kHz transponder placed approximately 1 m off the bottom in 35 m depth and aligned to the tidal flow using a large vane. Greater ranges were recorded but with decreasing reliability. With one transponder on each wing-end of PT167 and one on the cod-end, it was possible to identify the gear position in relation to the ship, but interference was experienced on one frequency and the relatively short wing-end spread indication was rather variable.
7. The acoustic cod-end diameter measuring system was calibrated in harbour and tested at sea both on-line with a cable attached and in self recording mode. Normally only sporadic results were obtained usually during shooting and hauling but when the transducers were constrained in their alignment, the distance was correctly measured and recorded with 100% reliability. We conclude that the transducers do not self-align as predicted and a wider beam width will be required.
8. Six water samples and two bottom samples were obtained from various locations around Orkney to be analysed for the PSP monitoring programme.

Don Urquhart
11 May 1992