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FRV *Clupea*

Cruise 0999C

REPORT

8-13 June 1999

Personnel

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Objective

To continue collection of data on shoal shape dynamics as part of the laboratory's commitment to the AVITIS project and project EDF1.

Out-turn days per project: 3 days MFO 167, 3 days C594.

Narrative

Clupea sailed from Fraserburgh at 1200 hours on 8 June, arriving in Kyle of Lochalsh on the morning of 9 June where it was joined by scientific staff. The towed bodies for the EK500 transducer and the Reson Seabat multibeam sounder were set up during passage to Islay; new software was installed for the collection of acoustic data; and the thermosalinograph was set up to record sea surface temperature and salinity continuously. Calibration of the 120 kHz echosounder took place at anchor in Loch Buie, Isle of Mull on the evening of 9 June. This exercise was carried out successfully using a 38.1 mm tungsten carbide sphere, a target usually reserved for the 38 kHz sounder.

On the morning of 10 June, *Clupea* headed west along latitude 56°10'N in an attempt to survey the Islay shallow sea tidal mixing front. Weather conditions proved to be inappropriate for the level of sampling envisaged: in particular, the deployment of the CTD probe proved to be dangerous, as both the crane and the hydrographic winch were occupied with towed bodies. The latter sampling programme was, therefore, abandoned and *Clupea* headed for the alternative sampling site in the Clyde, anchoring in Lamlash Bay, Isle of Arran at 1900 hours. A successful calibration of the 38 kHz echosounder was carried out later that evening. An additional calibration of the 120 kHz echosounder, using a 33.1 mm tungsten carbide sphere was also carried out; the results were in good agreement with those of the previous day's calibration. A total of seven water samples were taken throughout the day for calibration of the thermosalinograph.

A survey of the areas around the north east of Arran (Sannox), Inchmarnock, Lamont Bank and the waters around Great Cumbrae Island was carried out on 11 June to establish the whereabouts of the best fish school concentrations. No significant school structures were

found. The decision was made to return to the Sound of Islay were some schools had been detected during passage. However, *en route*, towards the outer reaches of the Clyde, the echosounders and multibeam sonar were deployed on a pole on the starboard side of the vessel. A transect, running west along latitude 55°13'N, was surveyed in an attempt to traverse the sea surface temperature anomaly that had been observed in this area the previous day. A total of 3.7 GB of sonar data and 115 MB of echosounder data were collected. Five CTD casts were taken to establish the hydrographic structure of the transect, and nine water samples were taken.

On the morning of 12 June a number of fish schools were detected south of the Sound of Islay. The acoustic sensors were deployed on the pole and a number of transects running approximately north-south were surveyed. These transects were of a "tight" double track parallel survey design, adopted to obtain complete coverage of a small area. A total of 8 GB of sonar data and 100 MB of echosounder data were collected. The pelagic trawl was deployed at 1300 hours to identify the fish schools: the net was meshed with sandeels and small clupeoids. Four CTD casts and eight water samples were taken. Work ceased at 1700 hours in order to allow the vessel to make passage through the Sound of Islay to a safe anchorage.

The vessel made passage back to Kyle of Lochalsh on Sunday 12 June and scientific staff unloaded the vessel on 13 June.

Results

A large amount of data, over 12 GB, was collected with the multibeam sonar on fish schools and stored on WORM CD. These data are an improvement on previous recordings because they were obtained with the new collection program which attaches position information from the GPS system into each sonar image frame. This information will allow for the calculation of school parameters required by the AVITIS project. Acoustic data were also collected in the presence of dynamic hydrographic features. These will serve to indicate what effects such changes may have on the quality of data.

The echosounder data were also collected with a new program - "Echoview". This is also an improvement on the previous, UNIX based, system; primarily due to its ease of use, its real time display facilities and its built-in image analysis school extraction module. The data and analysis facilities available with this new system are more amenable to the validation of sonar data required for the AVITIS project.

Three successful calibrations were carried out, including one which indicates that in future, calibration of the 120 kHz system may be achieved more conveniently using the same sphere as that for the 38 kHz.

P G Fernandes
24 June 1999

As seen in draft: A Nicol, Master, FRV *Clupea*