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FRV *Clupea*

Cruise 1298C

REPORT

20-27 July 1998

Ports

Loading: Fraserburgh
Unloading: Lerwick

Personnel

E Macdonald	B2	(in charge)
R Adams	B1	
M Kelly	B1	
I Campbell	PhD student	RGU
A Wiegand	Visitor	RGU
L Joyce	PhD student	Heriot Watt, (21 July))

Objectives

1. To conduct a hydrographic and biological survey of the Orkney and Shetland area.

2. To retrieve tide gauges and Mini-logger mooring from locations in Scapa Flow.

3. To collect sediment samples by Day Grab.

4. To test and evaluate laser fluorimetery systems developed between RGU and MLA for surface fluorescence and pump/probe fluorescence measurements from water samples.

Out-turn days per Project: F07n - 8 days.

Outcome

Scientific staff joined the vessel in Fraserburgh at 0930 hours on 20 July 1998. *Clupea* sailed at 1400 hours and anchored off Stromness at approximately 2350 hours. *Clupea* berthed in Stromness at 0815 hours the following morning, where Linda Joyce joined the vessel. At this point, a fault was detected with the echo sounder. Once operational, the vessel left Stromness at approximately 1000 hours and proceeded towards Hoxa Sound to commence sampling.

On arrival at the first station, it was found that the water bottle system on the SBE 25 CTD was not functioning, so Knudsen water bottles were used instead. This delayed the time taken on station, as two deployments were necessary for the CTD data and water samples. Seven stations were successfully completed on the afternoon of the 21st. The tide gauge from Scapa Bay pier was retrieved and the data downloaded. The vessel proceeded to Hoy Sound for further sampling. *Clupea* then proceeded to Stromness where Linda Joyce disembarked at

2100 hours. The Stromness tide gauge was lifted at 0800 hours on 22 July, then *Clupea* left Stromness to recommence sampling. Twelve stations were successfully completed within Scapa Flow and whilst on passage along the eastern side of South Ronaldsay. During the day the mooring at Cava and the tide gauge at Lyness were retrieved. All instruments appeared to have worked successfully. The vessel anchored overnight in Deer Sound.

On 23 July, *Clupea* proceeded northwards through Stronsay Firth and Westray Firth working hydrographic stations along the route. The line of stations across the Fair Isle Gap was commenced, but not completed, and the vessel anchored overnight in Lopness Bay, Orkney. The following day, the Fair Isle line was resumed and completed. Four more stations south west of Shetland were carried out and the vessel anchored overnight in Clift Sound. The next day, a 12 hour anchor station was carried out in Clift Sound in an area of high fluorescence. Hydrographic stations were carried out hourly over a 12 hour period. On 26 July, a series of grab stations were sampled in Clift Sound, Weisdale Voe, Whiteness Voe and southwards to Fitful Head. The vessel then steamed for Lerwick, berthing that evening. Surface temperature, salinity and fluorescence records were collected by thermosalinograph during the cruise.

Results

Forty-eight hydrographic stations were completed including the 12 hour anchor station (Fig. 1). At each station samples were collected for phytoplankton and nutrients, and calibration samples for salinity and chlorophyll were also taken. These samples will be analysed in the Laboratory. There was evidence of thermal stratification in some parts of Scapa Flow, with surface waters at around 12 degrees, decreasing to around 11 degrees at approximately 10 m depth. There were very high fluorescence readings in the eastern side of Scapa Flow, which may have been associated with a dense bloom of the diatom *Pseudonitzschia* spp. in the area. Fluorescence was much lower on the western side of the Flow. In Shetland, sea surface temperatures ranged from 11 to 12.5 degrees, and the voes on the west side of Shetland were highly stratified. Surface fluorescence readings were extremely high in these voes and these may have been associated with dense concentrations of dinoflagellate or flagellates, associated with the marked thermal stratification in these areas.

E Macdonald
12 August 1998

Seen in draft: A Simpson, OIC

Water sampling stations CLUPEA (C1298)