In Confidence:

R1/7

5IR79
AR

FRV 'Mara'
Cruise 5/79
Report
05-29 June 1979

Aims

To measure sand clouds generated by both polyvalent and Vee boards in order to compare with those already made with rectangular flat and cambered boards during 1978.

To make direct observations on the behaviour of sand clouds generated by polyvalent boards fitted with and without weights.

To make direct observations and record, using television, the behaviour of fish in the vicinity of the spreading wires and sand clouds.

Measure the turbidity of the sand clouds generated by various trawl boards using a newly developed instrument.

Procedure

The whole programme was carried out working in the Spey Bay test area. Only 2 of the 17 working days were lost during the cruise due to bad weather. The water clarity for diving observations was good for 3 of the 4 weeks when it became poor due to a heavy northerly swell.

Mr Ashworth, a commercial supplier of fishing gear who loaned us a new set of small (5' 3" x 3' 2") polyvalent boards fitted with 10' chain backstrops and adjustable weights joined the team for the third week.

Results

Using a new diver hand held sonar unit and a speed log fitted to the underwater vehicle spot checks were made confirming last years' measurements of the spreads between the trawl boards and between the wing-ends of the trawl. These new instruments have helped to give a more reliable and accurate geometry of the trawl gear under investigation.

The sand clouds were measured for both the polyvalent and Vee boards which now completes the programme for all 4 sets of trawl boards when used with both 15fm and 30fm spreading wires.

A few typical examples of the sand cloud distances from the wing-ends for two lengths of spreading wires are shown in the table.

	30fm spreading wires		15fm spreading wires	
	Speed knots	Sand cloud distance outside the wing-end	Speed knots	Sand cloud distance outside the wing-end
Flat board	2.9	1 metre	2.9	0.25 inside wing
Cambered	3.1	5	2.9	1.5
Vee	3.1	3.5	3.1	0.5 inside wing
Old Polyvalent	3.0	3.5	2.9	2.0
Modern Polyvalent	3.0	5	-	-

One week was devoted to the study of a set of modern 145kg polyvalent boards fished with 30fm spreading wires. These boards were approximately $\frac{3}{4}$ the surface area of any of the 4 other boards used in the trials but they consistently gave the second best spread.

	Speed	Spread
Flat board	3 knots	29.2 metres
Cambered		33.8
Vee		27.5
Old polyvalent		30.0
Modern polyvalent		32.0

A 45 minute video film has been made demonstrating the behaviour of these modern polyvalent boards with various minor adjustments to the lengths of the backstrops whilst varying the towing speed. The film also shows the behaviour of the same board with and without additional weights; the same board fallen down and towed to an upright position again and a change of towing direction of 90°.

Unfortunately the new turbidity meter was not sensitive enough to measure the difference between the sand clouds and sea water. The light meter which was also part of the instrument was unable to record the low light values found near or in the sand clouds. Valuable experience and information was gained in using the turbidity meter from the underwater vehicle and this will be invaluable in producing an improved version.

J Main
16 August 1979

Seen in draft: James A Calder (Relief Officer-in-charge)