

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD,  
FISHERIES LABORATORY, BENARTH ROAD, CONWY, GWYNEDD LL32 8UB

1991 RESEARCH VESSEL PROGRAMME

REPORT: DUTCH RV TRIDENS (second week of two)

STAFF:	W Blom	SIC	RIVO (Ijmuiden)
	D de Haan		RIVO (Ijmuiden)
	D Gouda		RIVO (Ijmuiden)
	A Kraayenoord		RIVO (Ijmuiden)
	K Groeneveld		RIVO (Ijmuiden)
	B Verboom		RIVO (Ijmuiden)
	M Fonds		NIOZ (Texel)
	M Bergman		NIOZ (Texel)
	I Kroncke		AWI (Bremerhaven)
	S Kuhne		AWI (Bremerhaven)
	K Lange		BFA (Hamburg)
	B Spencer		MAFF (Conwy)

DURATION: 27-31 May 1991 (from Ijmuiden)

LOCATION: Coastal waters north and west of Dutch Frisian Islands

AIMS:

1. Compare performance of 12 m beam trawls rigged for plaice and sole fishing.
2. Measure survival of various benthic invertebrates caught by two methods of fishing.
3. Identify and measure sizes of animals and survival of fish which pass through sole net within 5 minutes of fishing.
4. Examine penetration of gear into seabed by side scan sonar and underwater television.
5. Take box core samples of seabed.
6. Test benthos sampling dredge.

NARRATIVE:

This cruise scheduled to last for two weeks (excluding weekends which is the Dutch practice) repeated many of the aims of similar cruises in 1989 and 1990 to measure the impact of beam trawling on the benthos on the seabed off the Dutch Frisian Islands. MAFF provided two observers (R. Millner, B. Spencer) who each spent one week aboard. The second week comprised less than four days fishing with most of Monday (27th) lost due to a delayed start for gear repairs and all of Friday (31st) due to an early return to port to offload the gear.

The fishing grounds, mostly of firm sandy soils, were located off the Dutch Frisian Islands, west of Texel and north of Ameland. Fishing activity mostly compared the catch of the two

12 m beam trawls rigged for plaice and sole fishing. The plaice net had a 12 cm mesh and was rigged with 5 tickler and 5 net chains. The sole net had an 8 cm mesh and was rigged with 10 tickler and 10 net chains. Both sets of gear were deployed simultaneously and were fished for 1.5 h which is near to the 2 h of commercial practice.

The variety and abundance of fish and benthos was recorded for each catch, and the survival of various benthic invertebrates from the two types of trawl was measured over 2 days by keeping the animals in tanks of running seawater. The species most frequently tested were *Asterias*, *Astropecten*, *Ophiura*, *Corystes*, *Eupagurus*, *Liocarcinus*, and *Aphrodite*. Their hardiness varied greatly between species with the echinoderms showing good and the crabs showing poor survival. Other species which showed high damage rates were *Artica* and *Cancer*.

Penetration of the gear into the seabed was monitored on two occasions by side scan sonar deployed from Dutch RV Volans but a track was found only on one occasion. The underwater TV was quite a useful tool for observing the performance of the trawl. The vehicle, an improved version of a DAFS design and provided by BFA, Hamburg, viewed the first tickler chain during 1.5 h of fishing.

The sand, thrown up by the chain, flowed through the orifices of the links indicating that only the bottom section of the links, ie 1-2 cm were penetrating the seabed. It is the Dutch view that the additive effects of the 10 tickler chains amount to a penetration depth of ca. 6 cms. This view, largely based on observations of the damage rate sustained by small and large heart urchins which bury up to 10 cm in the soil, was not disputed by the TV observations.

Benthos sampling with a box cover occupied only a short session of a few hours. The sediment was graded into size fractions and preserved for later examination at Bremerhaven. The benthos dredge was technically inadequate for fast sampling and needed modifying to keep it on the seabed.

Conclusions: This cruise provided the ideal opportunity to gain experience for an assessment of the impact of beam trawling on the benthos. Many of the techniques and equipment used in the Netherlands may be transferred to the UK scene to provide an initial view of the likely impact of our beam trawlers on the benthos.

Brian Spencer  
11 June 1991

Initialled: S J L



**Distribution:**

Basic list +  
Mr P Boyling, MEP., LNH  
Mrs A Blackburn, Fish II, LNH  
Dr Millner  
Dr W Blom, RIVO  
FCR 35