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In confidence:- Not to be quoted without prior reference to the Laboratory

R1/4 Cruise Report

FRV 'Explorer'

9-31 August 1977

Objectives

a) to deploy current meter moorings in the northern North Sea and Firth of Forth.
b) to conduct hydrobiological surveys in the northern North Sea and Firth of Forth (including the proposed sludge dump grounds).

Narrative

'Explorer' sailed at 1400 on 10 August. The first priority was to deploy the current meter moorings off Peterhead, Orkney then St Abbs Head. Whilst en route to the St Abbs area 'Explorer' lay at anchor for 20 hours in Aberdeen Bay so that urgent repairs to her condenser tubes could be carried out.

Grab stations and Agassiz trawls were conducted at the proposed Forth sludge dumping grounds and a 12 hour anchor station on 16 August was conducted near Fidra to collect samples for particulate analysis. Hydrobiological sections were then worked north-east of Peterhead to as far as Shetland from then until 24 August, except for a brief period on 19/20 August when 'Explorer' called at Aberdeen. On the 24/25 August a continuous physical/fluorometric survey was conducted east of Orkney. At this point it was decided that 'Explorer' must return to Aberdeen at least 48 hours earlier than planned because of the state of her condensing system. Consequently, the northern North Sea moorings were lifted on the 26 August, the two long term Firth of Forth moorings deployed on 27 August and the St Abbs Head moorings were lifted on 28 August. The remaining time was spent working part of the Firth of Forth hydrobiological grid.

'Explorer' docked in Aberdeen at 0500 on 29 August.

Preliminary Results

1) Northern North Sea

The measurements confirm that the Fair Isle inflow is a source of nutrients into the northern North Sea. This in part may have contributed to very high chlorophyll (probably exceeding 50mg/m^3) between the inflow and the east coast of Orkney and the Moray Firth. Detailed surveys showed that bands of high chlorophyll, approximately 5 km apart, were aligned to the inflow. These bands reflected physical variability in the area.

Considerable short term fluctuations in the location of the Fair Isle inflow occurred.

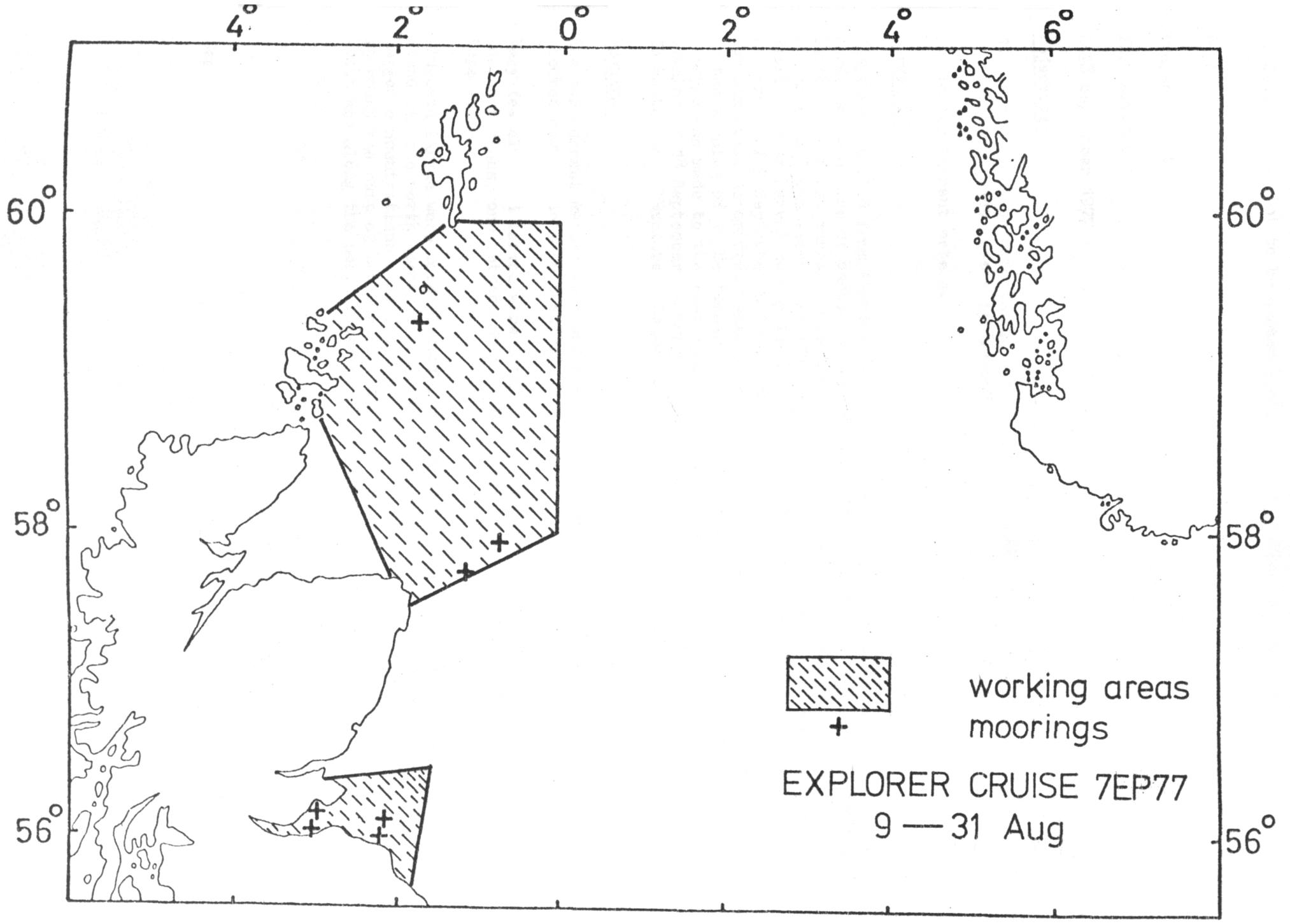
2) Firth of Forth area

The benthic surveys at St Abbs and Bell Rock demonstrate that the former has a wide epibenthic species diversity. In contrast the Bell Rock ground fauna was relatively sparse.

Residual currents between St Abbs dump ground and the coast were parallel to the coast and exceeded 10cm^{-1}. Thus it would appear that locally there is little danger of dump material encroaching inshore.

H D Dooley
27 October 1977

Seen in draft J W Gillon


4°
2°
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working areas
moorings
EXPLORER CRUISE 7EP77
9 — 31 Aug