R1/3

Not to be cited without prior reference to the Laboratory

RV *Forth Ranger*

Charter Cruise

REPORT Ref H04

10-11 January, 19-21 February, 12 March, 27 March and 9-11 May 1990

Personnel

P W Balls	SSO (in charge)
R Payne	HSO
R Laslett	PhD Student

Objectives

1. To deploy and maintain a current meter/transmissometer mooring.

2. To undertake chemical surveys of the Firth of Forth and Forth estuary.

Narrative

The mooring instrumentation was calibrated and recovered from the Rosyth position during the January cruise and was subsequently redeployed at Hound Point in February. Engineering problems with the *Forth Ranger* prevented calibration of the instruments until March. The mooring was recovered in May following a final calibration.

Chemical surveys of the Firth of Forth were successfully obtained in January, March and May. Poor weather prevented the estuary survey in January but it was completed later in the month; the March and May surveys were completed as scheduled.

Results

The current meter/transmissometer assemblies, which on previous deployments had worked well, developed faults during 1990. This resulted in three of the four records having to be rejected, overall however five good records have been obtained. Full evaluation is scheduled for later in the year. Initial results demonstrate the dramatic increase in turbidity in progressing from neap to spring tides. Superimposed on this larger scale variation are the daily ebb/flood cycle. While the ebb tide increases turbidity throughout the water column the flood tide characteristically results in enhanced turbidity in bottom waters.

Chemical surveys reveal changes associated with both river discharge and season. Decreasing discharge permits salt water to enter the shallow upper part of the estuary where a distinct turbidity maximum develops. Nutrient concentrations decrease in association with the spring bloom but there is evidence of land run off boosting concentrations following rainfall events. As river flow decreases an oxygen minimum develops in the upper estuary and dissolved manganese concentrations increase. Full interpretation of chemical data awaits the completion of analysis.

P W Balls

28 August 1990