John Hughes

Sea Vigil 4
Cruise Report
17-20 January 1994

Personnel:

Robb. Howland (PML)
Bob Clifton (PML)
Trish Frickers (PML)
Steve Widdicombe (PML)
Duncan Plummer (LOIS, Hull)
Jack Hardisty (UOH)
Helen Rowse (UOH)
Jeremy Hoad (UOH)

Itinerary:

Monday 17th January: PML scientists travelled to Hull, arriving in the late afternoon. Scientists from the University of Hull, plus Duncan Plummer, carried out a series of profiles across the Humber mouth (list of stations given in Appendix 1) with the objective of characterising the particulate interchange between the Humber Estuary and the coastal zone. A series of 15 stations between Tetney and Spurn Point were visited during two transects of the estuary mouth. At each station measurements of temperature, salinity and turbidity vs depth, together with calculations of drift, were recorded. In addition, insrument mountings were secured to Bull lightfloat and photographs were taken at Haile Sand Fort with a view to future instrument deployments. Sea Vigil locked in at the marina in Hull at 1900, and immediately loaded PML equipment for estuarine profiles during the rest of the week.

Tuesday 18th January: Departed Hull Marina at 0715 and carried out an axial profile of the estuary from Hull to Black Toft jetty with a short excursion (1 km) into the Trent. The run was timed to reach Black Toft at high water. During the profile measurements of salinity, temperature, pH, suspended particulate material, gravimetrics, C/N and nutrients (nitrate, nitrite, phosphate and silicate) were made. On the upstream run we followed the channel to the south of Reads Island, while on the return we kept to the northern channel. Returned to the marina at 1300, at which time Bob Clifton and Steve Widdicombe commenced their intertidal mud flat sampling (see appendix 2).

Wednesday 19th January: Locked out at Hull at 1220 and commenced axial profile downestuary to Spurn Head. On the downstream leg we followed the main channel near to the south shore as far as Haile Sand Fort, then crossed

the estuary mouth to Spurn, and returned along the northern channel. The determinands measured were as for the previous day but with the addition of ammonia. Returned to Hull at 2000.

Thursday 20th January: Departed Hull at 0830 on an axial transect upestuary almost as far (3 km short) as Goole. During this transect we kept to the main (northern) channel and did not go into the Trent. We turned at 1110 and returned along the same track. During the profile the measurements made were as for the previous day. Locked in to Hull Marina at 1400 and packed all equipment. Unloaded equipment at 1800, when the van returned on completion of the intertidal work.

Friday 21st January: Early on Friday morning Bob Clifton and Steve Widdicombe met Duncan Plummer at Black Toft jetty to change over the EMP 2000 instruments. There had been two previous attempts to do this, the first frustrated by lack of light and the second by seized/corroded jubilee clips. This third attempt failed because they were unable to tension the new clips. As a result of this the workshop at PML have now fabricated a permanent bracket which will be attached to the jetty, into which the EMP 2000 will be clamped (and quickly and easily released). On completion all PML staff returned to Plymouth.

Summary.

This first LOIS Core Programme field trip went very well. All equipment functioned, with the exception of the oxygen sensor on the NRA's AML instrument. I have had an assurance from Sea Vigil that this will be rectified before the next field trip. Standard suite data was logged each minute during the transects and will be passed on to BODC on floppy disc at the end of each field trip. Valuable experience was gained by Bob and Steve on the intertidal sites and subsequent discussions have outlined a clear strategy in the run-up to the RACS(C) workshop at the end of March. From the Sea Vigil work two recommendations are made which will make future operations smoother and more streamlined. These are:

a). To make use of the 'moon pool' (accessed through a panel in the aft deck) to deploy a submersible pump which will supply water for all analysers and discrete sampling. The Sea Vigil's peristaltic pump does not supply enough water.

b). Revise the survey track and the numbering of stations throughout the estuary from those used by JoNus (which appeared to be several different numbering systems superimposed on one another) to a strategy which will more fully meet the requirements of the LOIS Core Programme. This has been discussed between myself, Duncan Plummer and Roy Lowry and will be put into effect during the next field trip in February.

The hotel booked for us by Duncan Plummer turned out to be very convenient for the Marina, cheap, pleasant and very central. We all recommend its use in the future.

Appendix 1.

Station	Latitude	Longitude
Tetney	53° 31.20'N	00° 02.85'W
	53° 31.85'N	00° 03.10'W
	53° 32.07'N	00° 03.35'W
	53° 32.29'N	00° 03.60'W
	53° 32.52'N	00° 03.85'W
	53° 32.75'N	00° 04.09'W
	53° 32.94'N	00° 04.33'W
	53° 33.20'N	00° 04.58'W
	53° 33.42'N	00° 04.80'W
	53° 33.64'N	00° 05.02'W
	53° 33.87'N	00° 05.30'W
	53° 34.10'N	00° 05.55'W
	53° 34.32'N	00° 05.77'W
	53° 34.54'N	00° 06.01'W
Spurn	53° 34.78'N	00° 06.29'W

Appendix 2

Humber Fieldwork 17/1/94 - 21/1/94

1. Sub-tidal sampling from 'Sea-Vigil'.

The small PML box-corer was not available during this period. Examination of the winch/lifting gear on the Sea Vigil would indicate that this vessel may not be suitable for the deployment of the PML box corer. This has to be investigated further i.e:

(a) Is the winch "man enough" to pull the corer out of deep mud?
(b) Would a new pulley help?
(c) Is the frame high enough?
(d) Is the 'Sea Vigil' able to maintain position in the strong tidal streams of the Humber for box-coring to be completed safely.

We need to get some idea of the strains involved when lifting the corer out of the mud. Perhaps RVS can advise or a stain gauge can be fitted during deployment elsewhere e.g. 'Squilla'.

During the next field trip, in February, we will be testing two corers which may be suitable for use from Sea Vigil. These are:
a). the NRA's 'Haps' corer, which takes a 13.5cm dia by 26cm deep core and,
b). the Oban lab's 'mini-multicorer' which takes 10cm dia by 25cm cores (two at a time, plus two smaller cores).

The feasibility of deploying 'Sea Vigil's' small boat, for sample collection, was discussed with the skipper. Although he did not dismiss the idea he expressed some concern about the deployment of this boat in the Humber, especially in adverse wind conditions.

1.2. Inter-tidal sampling of bed-sediments.

For the purposes of this visit, the sites selected were those used in the JoNuS programme. It is recognised that 'ease of access' from the road was an important criteria in selecting these particular sites and that, in future, further sites should be investigated with respect to the specific requirements of the 'LOIS' programme.

All of the 8 sites listed (Table) were visited by road between PM on 18/1/94 and PM on 20/1/94. Surficial samples were taken at 7 of these sites to a depth of 6cm at 1cm intervals. 2 samples were taken at Spurn where the substrate varied between shingle and mud. Lack of daylight prevented sampling at North Killingholm jetty - it was not a time or tide problem.

The sites, 2 on the south bank and 6 on the north bank of the Humber, were located between Spurn and the point where the River Ouse joins the Humber (Blacktoft). Map references, sediment types and access notes for each site are listed in the table.

It is our opinion that it is feasible to collect a suite of samples (by road), from 8 sites within the Humber region, for benthic, radionuclide and nutrient and metal flux analyses, over a period of 4 days. To do this it would be necessary to start PM on a Monday and finish AM on the following Friday and low water (Spurn) would have to be between 10.00 and 15.00 depending on the availability of daylight.

Bob Clifton/Steve Widdicombe (25/1/94)