CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCES, FISHERIES LABORATORY, LOWESTOFT, SUFFOLK

1997 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 4

STAFF:

J M Rees (SIC)	CEFAS
N Pearson	CEFAS
J Read (2-6)	CEFAS
L Fernand (6-8)	CEFAS
P Murray	UC
S Bass	UC
M Mason	UC

DURATION: 2 April 1997 - 8 April 1997

LOCALITY: Harwich and Wash

AIMS:

1. To recover the Minipod and Guard Buoy from Harwich.
2. To deploy Tetrapod and Quadrapod near North Ridge of Race Bank to measure near bed currents and suspended load concentrations (AE0711A0).
3. To deploy Minipods at North Docking Shoal Buoy, " Nut and Spanner", Burnham Flats buoy, Burnham Flats and Wainfleet Roads to monitor suspended sediment(AE0711A0).
4. To undertake sidescan lines and TV dips near Minipod/Tetrapod positions (AE0711A0).
5. To undertake an ADCP survey of Area 107 (North Docking Shoal), Race Bank and into the Wash to create an empirical model of the outer Wash (AE0711A0).
6. To deploy and recover a series of Argos Buoys in the plume of the dredgers to help understand plume dynamics and to validate the empirical model (AE0711A0).

To take water samples in the plume of the dredger to help calibrate Minipod sensors (AE0711A0) .

NARRATIVE: [note all times in GMT]

RV Corystes sailed just before the high tide at 1400 so as to reach the Harwich Minipod site before dark. On reaching the site the Minipod and Guard buoy were recovered and Corystes then sailed north to the main working area around the Wash. During the 3rd Minipods where laid at Area 107, "Nut and Spanner" and Wainfleet with their associated Guard buoys. Similarly on the 4th the remaining last two Minipods where deployed. Conditions where too rough to sidescan at North Ridge but TV images where obtained. An ADCP (Acoustic Doppler Current Profiler) and RoxAnn survey (seabed descrimination system) of the Inner Silver Pit was conducted overnight.

In Gale force winds a CTD section was conducted on the 5th between "Nut and Spanner" on Docking Shoal to Wainfleet Roads on the Lincolnshire coast. Conditions were too severe to transfer personnel on the afternoon of the 5th and this was not completed until

early on the 6th from Grimsby. As the Tetrapod was not being deployed (see Results 2 below) the Quadrapod was deployed at the North Docking shoal buoy along with two extra guard buoys. Over night the first four ADCP surveys of the outer Wash was completed.

During the morning of the 7th ADCP section were obtained behind the dredger Sand Heron working in the north west box of Area 107. Two Decca Argos drogues seeded into the plume from the dredger. After lunch further ADCP sections and CTD profiles where obtained in the plume from the dredger Sand Weaver. In the early evening the drifters were recovered and the second batch of four ADCP surveys was started. After completing the ADCP at 1000 on the 8th a TV dip was undertaken at North Docking Shoal.

Whilst waiting for the tide off Yarmouth, intense dredging operations in the Yarmouth boxes enable a further ADCP section behind the Sand Harrier. RV Corystes docked at 2100 at Lowestoft.

RESULTS:

Aim 1. The Minipod and Guard buoy were recovered safely from Harwich. Data from the minipod showed a strong Spring - Neap cycle in suspended sediment and an asymmetrical flood/ebb tide. Peak tidal speeds were over 70 cm s^{-1} 50 cm above the seabed were recorded.

Aim 2. The Tetrapod was not deployed as two primary sensors did not operate. The BASS (Benthic Acoustic Stress Sensor) and ABS (Acoustic Backscatter Sensor) have recently been upgraded to large hard discs and this resulted in incorrect communications between the processor and the hard discs. The sensors will be modified and redeployed on the Scotian Shore cruise in May. The Quadrapod was deployed with 11 syringes at the North Docking Shoal buoy with its sideways looking ripple sensor and two timed suspended sediment traps.

Aim 3. All five Minipods were deployed on their planned locations.

Aim 4. Two sets of four ADCP surveys where undertaken around Area 107 (Fig1). This will enable a "tidal stream atlas" of the area to be constructed. This will consist of current vectors over the whole area over a whole tidal cycle from approximatley 9m water depth to 3m above the seabed. Once constructed this "empirical model" will show where "virtual" particles seeded into the flow field track. The model will be validated with comparisons with the Decca/Argos drifters.

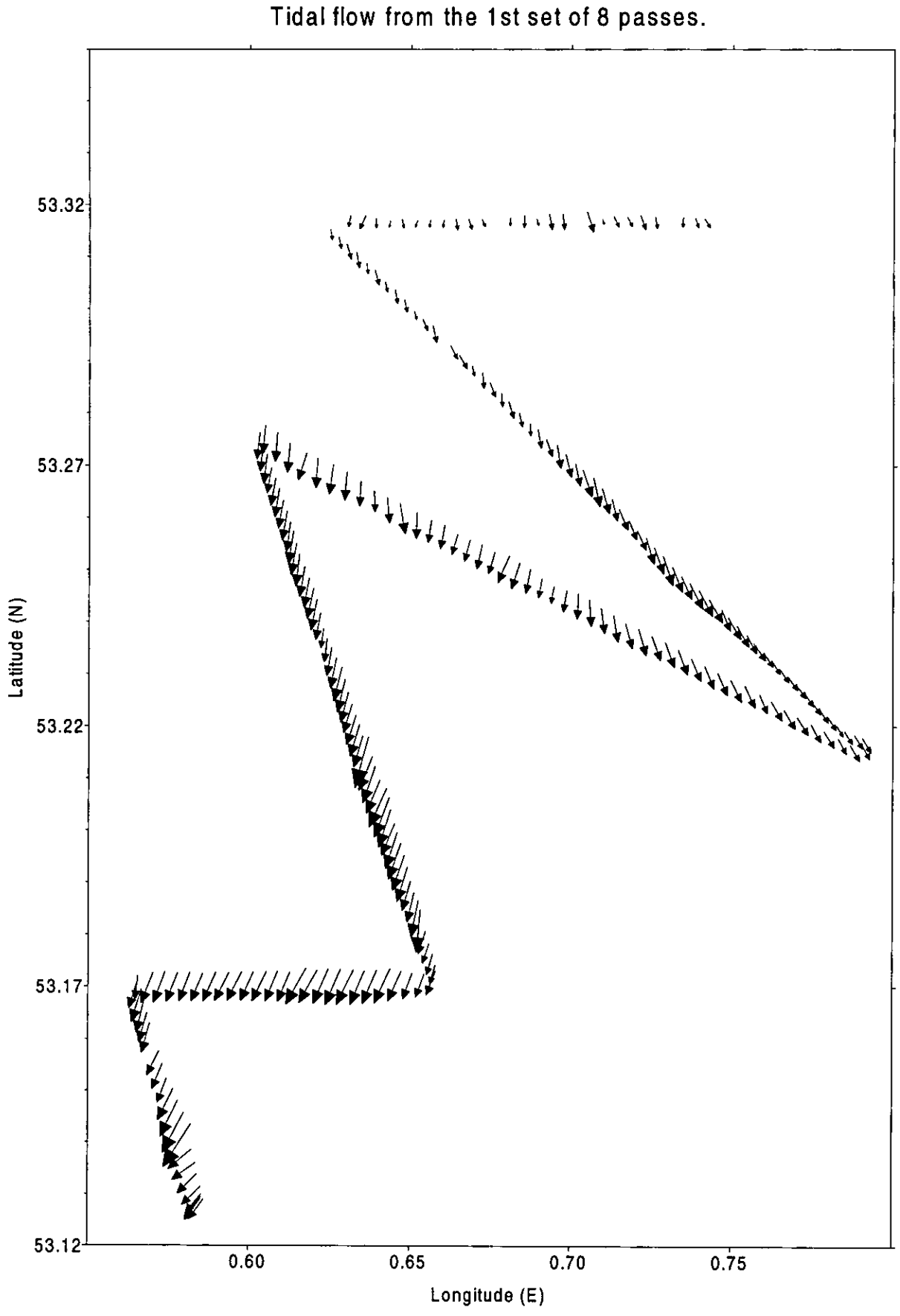
Tidal flow from the 1st set of 8 passes.
53.32
53.27
53.22
53.17
53.12
Latitude (N)
0.60
0.65
0.70
0.75
Longitude (E)

Figure 1

Aim 6. Two Argos drifters where released into the plume created by the Sand Heron. Initial results show that the drifters headed North towards Dowsing and then returned south on the flood tide

Aim 7. Water samples where take in the plume of the Sand Weaver and at a control station outside of the plume. A CTD section was conducted between "Nut and Spanner" and Wainfleet Roads to measure spatial gradients.

Additional Aim

ADCP sections behind the Dredger off Yarmouth shows a plume approximatley 1600 m behind the dredger Sand Harrier. This is surprising as the background suspended load is high and it was thought that there would be insufficient "difference" between the plume abd background to be able to distinguish the plume.

It is a pleasure to acknowledge the co-operation and skill of the Captain and crew in planning and taking water samples and ADCP sections close behind the dredgers.

Jon Rees SIC
8/4/97

SEEN IN DRAFT: **Master**
Senior Fishing Mate

DISTRIBUTION:

Basic list + Crew List
S J Malcolm
Chris Beach (ESFC)
G Singleton (SCS)
G Boyes (EPD)
S Rowlatt (BOC)
A Kenny (BOC)