

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE,
LOWESTOFT, SUFFOLK, ENGLAND

DRAFT 2005 RESEARCH VESSEL PROGRAMME

Draft Cruise Report : RV CEFAS ENDEAVOUR CRUISE 06 2005

STAFF:

Dr Liam Fernand	Mr Marc Childs
Dr Naomi Greenwood	Mr Paul Hudson
Mr Paul McCloghrie	Mr Suihaimi bin Suratman (UEA)
Mr Neil Needham	Mr Stewart Cutchey
Ms Olga Andres	Dr Johan van de Molan
Ms Al Joyce (part time)	

UEA (University of East Anglia)

DURATION: Friday 22nd April – Monday 2 May

Joined ship 09:00 BST (HW 09:49 GMT)

Docked Time Morning tide 1st May (HW 0400 GMT)

LOCALITY: 1 North Sea, Dogger Bank and North East coast

AIMS:

The project is generally aimed at achieving a better understanding of the dynamics of the circulation processes of the seas around the UK. In order to characterise the extent and nature of density driven and seasonal jet-like circulation which acts as a direct and rapid pathway for transport of material.

The aim of this cruise was to provide greater understanding of the role of buoyancy flux generated by riverine discharge in determine pathways of contaminants and nutrients. It occurred in the late spring - early summer period when river flow and transport might be expected to be of greatest concern.

As well as the thermohaline structure the Phyto plankton structure and nutrient uptake was investigated. With regular samples taken for particulate organic Nitrogen and Particulate organic carbon. PON, POC.

The main sampling aims of the cruise were:

1. Characterise the hydrographic structure associated with the buoyancy plume down the NE coast and onto the Dogger Bank. By use of towed undulating CTDs (scanfish)
2. Deploy ARGOS drifting buoys to quantify the Lagrangian circulation
3. Deploy Mooring (ADCP and thermistor chain) to study the mixing processes in the transitional region.
4. Conduct experiments for Phytoplankton production both by Nitrogen uptake method and by Carbon14 labelling.
5. Take samples for POC and PON analysis
6. Trial an Optical Nutrient analyser.

Cruise Narrative:

Endeavour sailed at 10:00 with the CTD on loan from DARDNE arriving at 12:30, unfortunately it was not compatible with our sure-fire system. A scanfish line was undertaken overnight through the silver pit. Each morning stations for primary productivity stations were taken at 0530 using Niskin bottles on a wire to take water from the appropriate depths. A further Scanfish line was completed into the coast just North of Whitby and the ADCP mooring and thermistor deployed.

Further CTDs and Scanfish lines were performed out from the coast, with a primary productivity station and N15 uptake being undertaken at 0530. Through Sunday further scanfish lines were undertaken from the North East Coast to the Dogger Bank. Monday ; A productivity CTD was undertaken in the deeper water off the Dogger Bank. Scanfish lines were undertaken North West from the Dogger and then due west along 55° 25N into Alnmouth bay. On Tuesday morning further CTDs were conducted up to the North of Farne Islands, Ms Joyce and an engineer were dropped off by small boat at Eyemouth, before a further scanfish leg from Agnes bay was completed. A further scanfish line along 56° North to the top of the Dogger was completed overnight stopping at 0430 for a productivity CTD at 56° 0 N 2 00 E . Following this further Scanfish lines were conducted into the coast, CTDs at 8 nm intervals were taken along the line 108 for PON/POC analysis. High levels of Chl a and large concentrations of zoo plankton were found on top of the Dogger Bank.

Further scanfish lines were conducted overnight and then the following day due South along 0° 15 E Thursday With a productivity station at 0430 GMT. Further CTDs were continued along the previously conducted scanfish line. The mooring position was checked and both lander and toroid were on position.

A scanfish line was commenced from the coast north of Middlesborough, static gear was successfully avoided. However just before recovery the scanfish roll sensor failed which resulted in collision with the bed. The intended scanfish line was aborted and further CTDs conducted.

After primary productivity stations 3 Argos buoys were deployed a CTDs performed before departure for Lowestoft. Good weather was experienced through out.

Results

All primary cruise aims of the cruise were achieved

Figure 1 shows the cruise track and positions of productivity experiments, towed undulating CTDs sections Fig 2 and Fig 3 show the typical sections from the North East coast with fresher water inshore and more saline conditions of shore. In both cases the density gradient is dominated by salinity inshore and then temperature off shore.

In the area North of the Dogger Bank, high levels of Chl-a were observed, up to 7 mg m⁻³ c. Figure 4 shows the results from primary productivity experiments using the Carbon 14 method were conducted along the scanfish line 108. The highest levels of a-a were found in the optically clear but cold < 8° waters north of the Dogger. Figure 5 shows a vertical profile taken by a LISST instrument which measures the size of particles, it is primarily detecting the phyto plankton as indicated by it's association with the fluorescence profile. We were sent outputs by e-mail from the NCOF real-time model which were a useful aid in cruise planning. Fig 6 shows the model output for the scanfish leg along 55 North which was taken 2 days later than the model run.

Thankyou to the officers and crew of the CEFAS Endeavour for their contribution to a successful cruise.

Liam Fernand

(Scientist-in-Charge)
2 May 2005

Distribution List
Basic + those on cruise.
Dr Keith Weston UEA
DRP Leonard (DEFRA, London)

Figure 1 Cruise Track CEFAS Endeavour 605

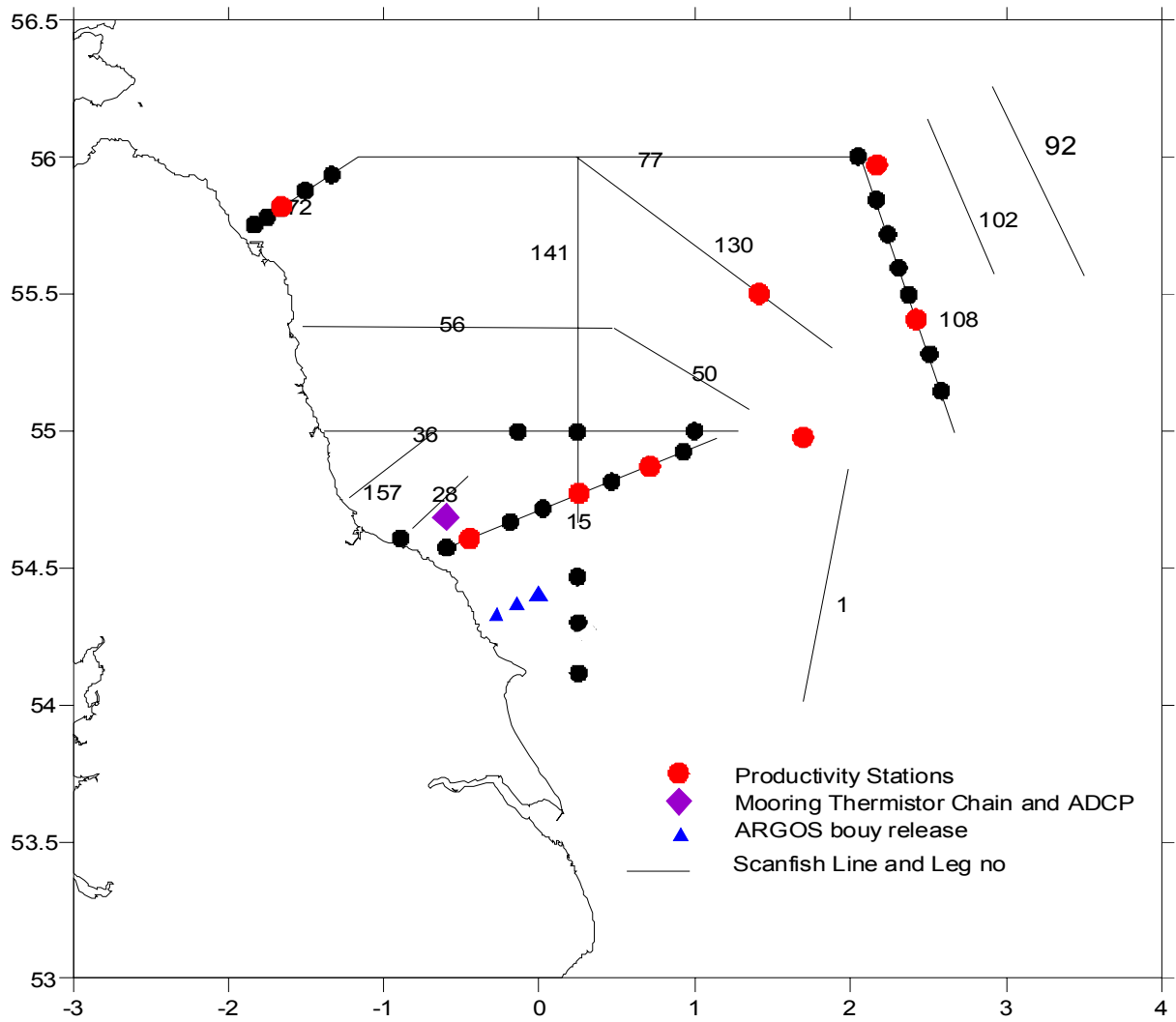
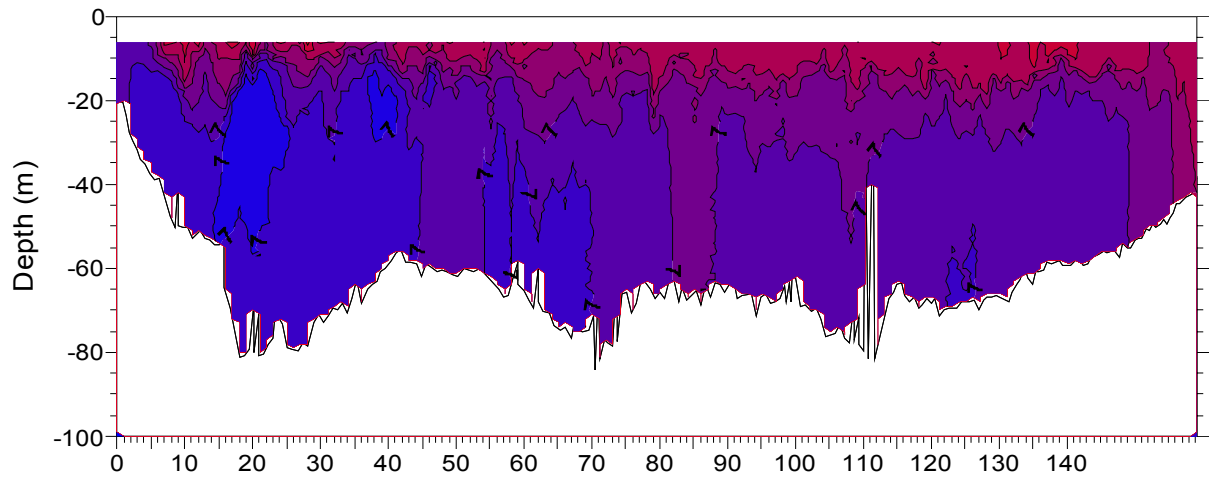
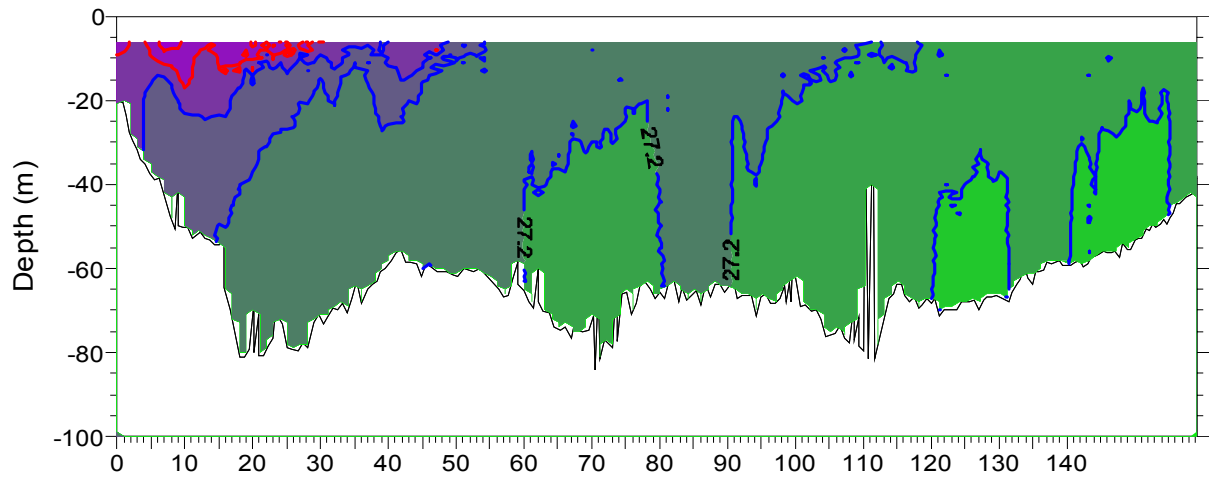


Fig.2

Temperature Plot Leg cend6036



Density Sigma-t Leg cend6036



Salinity ppt Leg cend6036

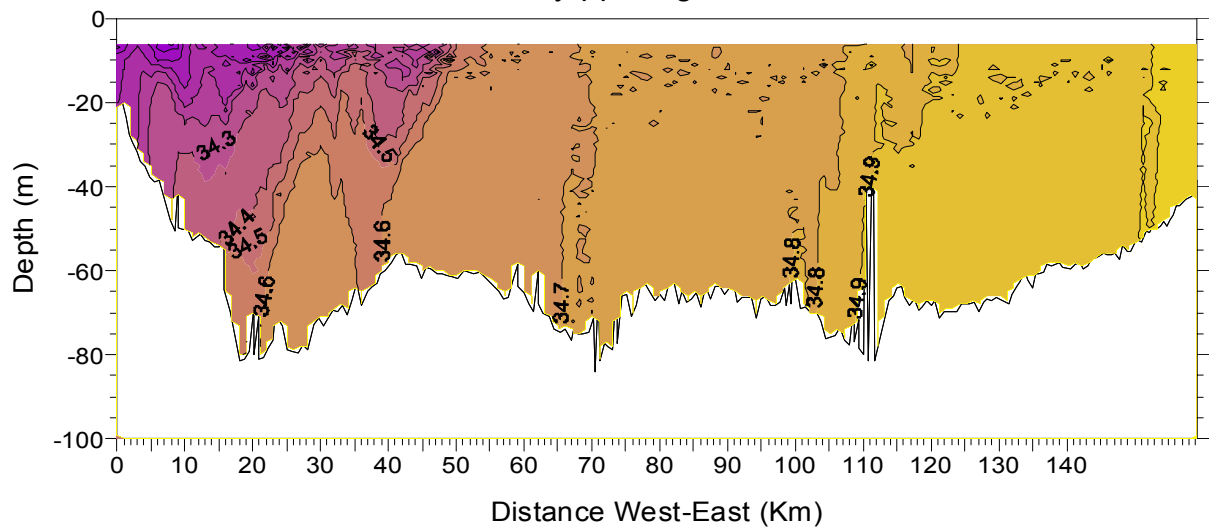
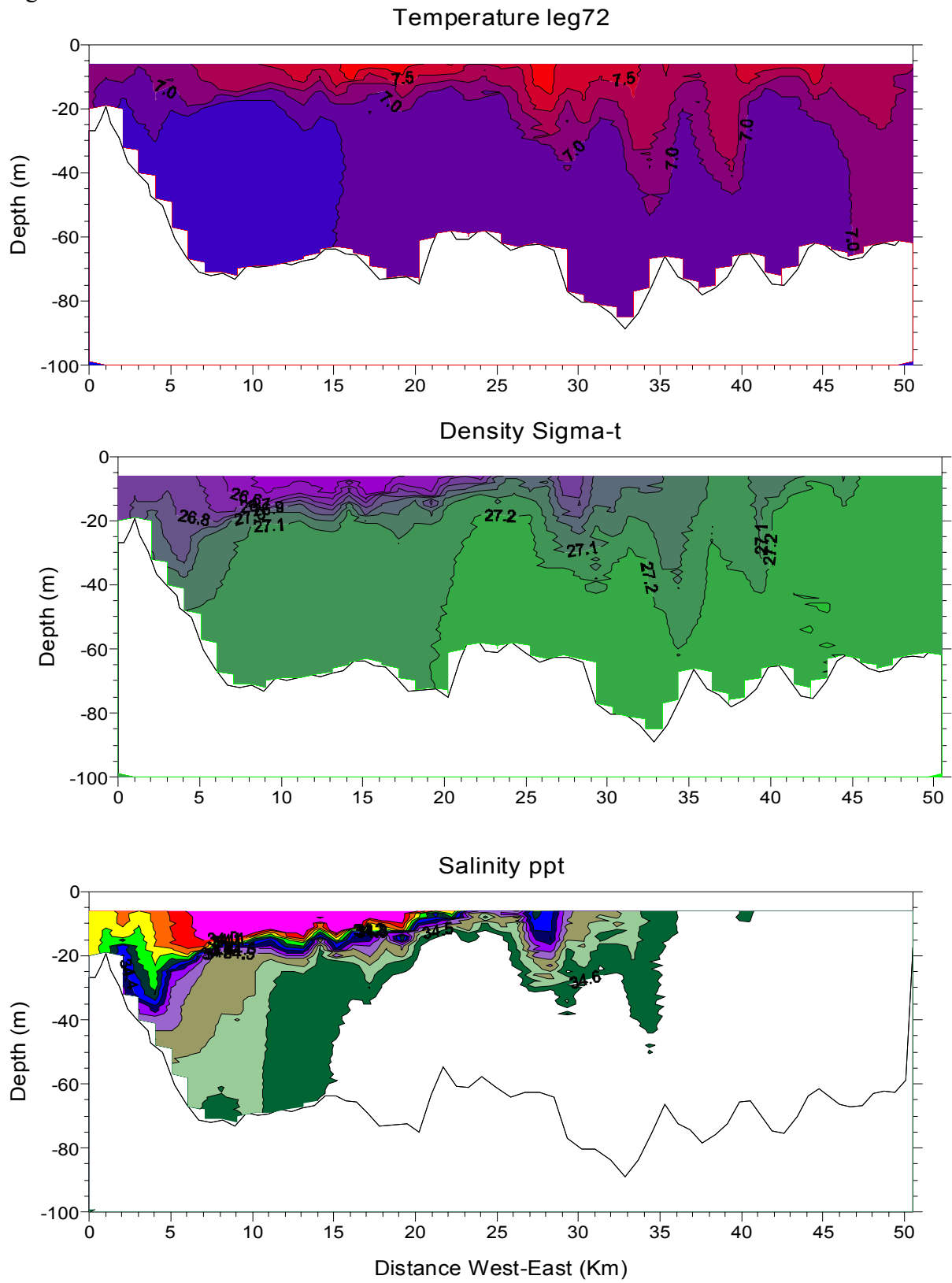


Fig.3



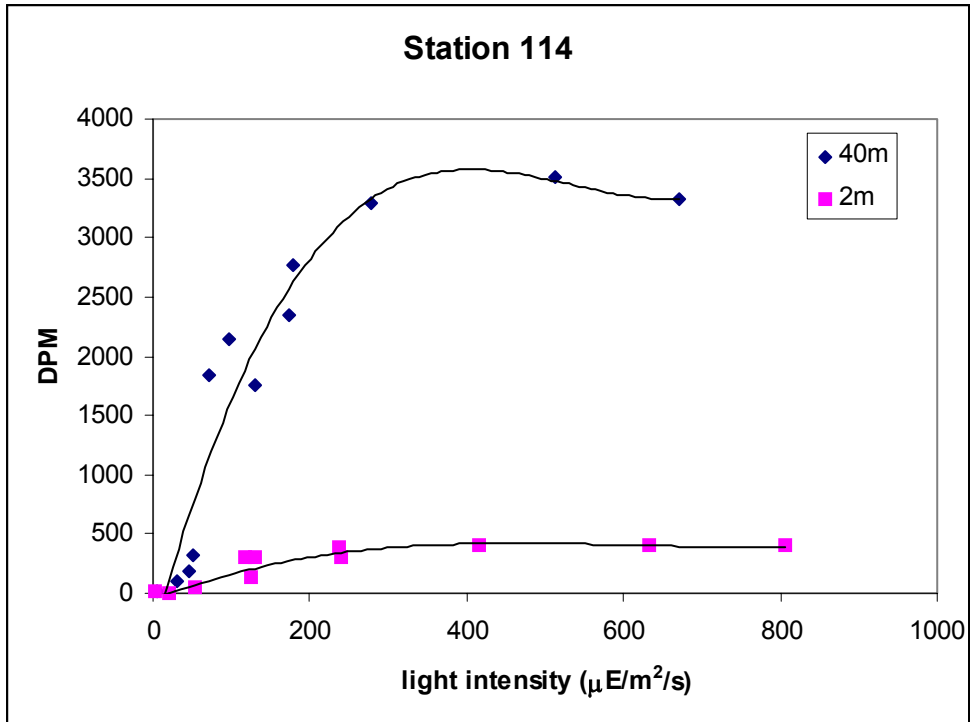


Figure 4 Results from primary productivity by Carbon 14 uptake

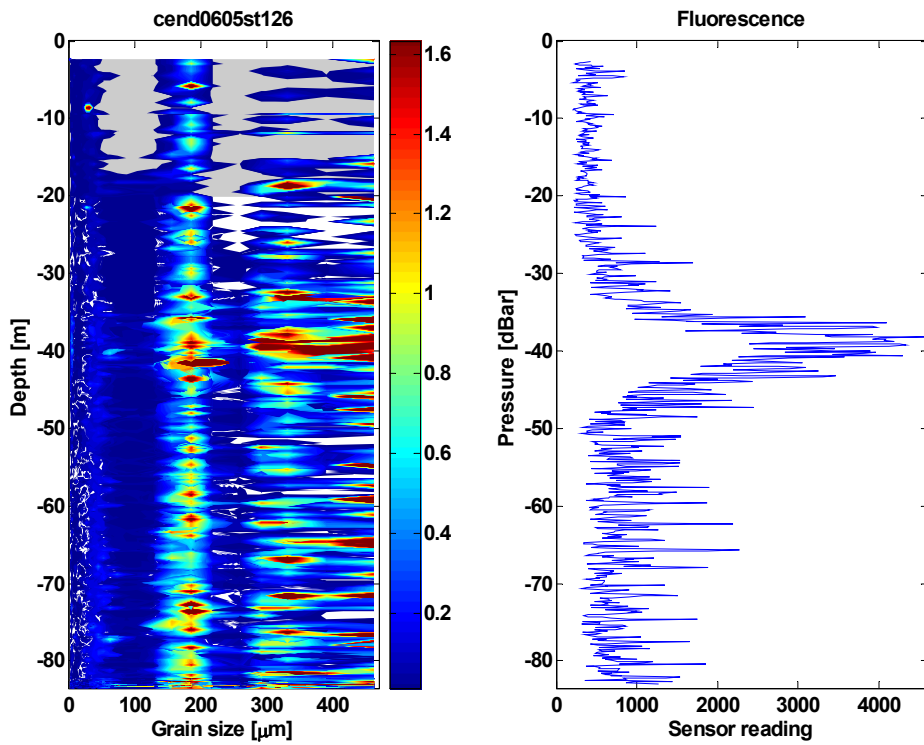


Figure 5 Results from LISST with fluorescence profile

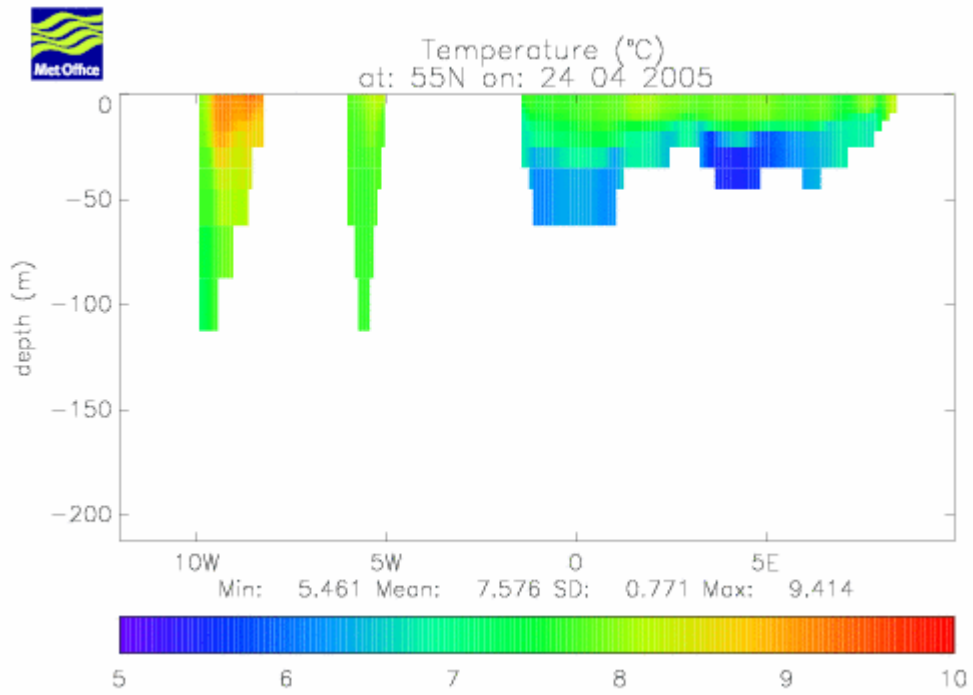


Figure 6 Metoffice model Temperature provided during the cruise (courtesy of J.Siddorn)