

RV Prince Madog: Celtic Sea cruise 2005, cruise report

3. Main Station Positions

Shelf Edge:

CS2: 48° 34.26' N, 09° 30.58' W depth = 201m

Jones Bank:

Bank 1: 49° 56.39' N, 07° 47.53' W depth = 122m Mooring

Bank 2: 49° 53.73' N, 07° 52.32' W depth = 114m Mooring, 25 hour station

Bank 3: 49° 51.21' N, 07° 56.87' W depth = 78m Mooring

OB: 49° 44.87' N, 07° 40.10' W depth = 110m 25 hour station

Data collected:

CS2, shelf edge:

300kHz bedframe ADCP, 6.7 days
17/07/05 1739 to 24/07/05 1152

300kHz sub-surface ADCP, 6.7 days
17/07/05 1739 to 24/07/05 1152

Thermistor chain:
22 VEMCO Tloggers,
17/07/05 1600 to 24/07/05 0850

3 Microcats
17/07/05 1600 to 24/07/05 0850

Bank site

Bank 1:
300kHz bedframe ADCP
26/07/05 to 31/07/05?? Trawled and returned early by fishing boat

~~Thermistor chain:
~20 VEMCO Tloggers
26/07/05 to 4/08/05

3 Microcats
26/07/05 to 4/08/05~~

Not recovered

Bank 2:

300kHz bedframe ADCP
26/07/05 to 4/08/05
600kHz subsurface ADCP
26/07/05 to 4/08/05
Thermistor chain
~20 Tloggers
3 Microcats

Bank 3:
~~300kHz ADCP
26/07/05 to 4/08/05
Thermistor chain
~20 Tloggers
3 Microcats~~

Not recovered

U2 site

300kHz bed mounted ADCP in sub-surface buoy (Fugro Geos)
19th July to 2nd August hopefully

~~Thermistor Chain:
10 VEMCO Tloggers
3 microcats
Deployed 16th July 2005, fate as yet unknown. The 'hippo' surface buoy was retrieved by HM Navy adrift in the Celtic Sea.~~

Not recovered

FLY data collected

25 hour dataset at shelf edge site CS2 successful
17th to 18th July 2005 (Neaps)

25 hour dataset at shelf edge site CS2 successful
23rd to 24th July 2005 (Springs)

25 hour dataset at Jones bank station 2 successful
26th -27th July 2005 (Springs)

25 hour dataset Jones Bank transect aborted due to bad weather after 6 hours.
28th July 2005

25 hour dataset at Jones bank station 2 successful
31st to 1st August 2005 (Neaps)

25 hour dataset at off bank station OB, successful.
1st to 2nd August 2005.

25 hour dataset Jones Bank transect, successful.

2nd to 3rd August 2005.

Ship-borne instrumentation

Data was sampled continuously throughout the cruise using the following instrumentation:

Hull mounted ADCP

Salinity, temperature, transmission and fluorescence in the surface water

Onboard meteorological station, including incoming solar radiation and PAR

Purpose and Problems

The original motivation for this work was to identify the processes driving mixing at the thermocline in summer stratified shelf seas and to help understand the physical and biological interaction within this environment. With the comprehensive microstructure data collected by the FLY team and the biological and chemical data collected by the Charles Darwin team, the data collected during this cruise should help us in furthering this research.

Despite a number of problems experienced with FLY at the start of the Prince Madog leg of the cruise, 4 full 25 hour datasets were successfully collected at the Jones Bank site, with no problems except a replaced shear probe in FLY #3 at the start of the Neaps station at bank 2 (with no break in the series) and bad weather slowing some of the positioning in the FLY transect across the bank. A significant and unique dataset has therefore been collected by the FLY team, containing microstructure measurements over the entire water column at a variety of positions over and around a shelf sea bank.

A number of problems were identified in the FLY equipment, some which have at least been temporarily addressed by Ben whilst on board, and have given us one working FLY for the second half of the Prince Madog cruise. However they all remain issues to resolve before further work is undertaken. The FLY team therefore suggests that FLY #3 and 4 are given complete service, either at SOS or by the manufacturer (preferred).

Problem	Action required	Action taken
Battery problems, specifically with FLY#3. Ben has identified a	New batteries for FLY#3	FLY#3 received the newer batteries from FLY#4. New batteries

problem with one of the cells and recharging problems have been noted.		were collected during port call at Penzance and fitted to FLY#4. A spare set were also acquired.
On changing the batteries a fault in the power supply was found in FLY#3.	New power supply circuit for FLY#3	The power supply circuit from FLY#4 was used, installing new components where available. The faulty one is beyond repair at sea.
Shear probes in both FLYs appear to give unbelievable outputs and disparity with each other	Install new shear probes	New shear probes were collected during the Penzance port call. 2 new shear probes were installed in FLY #3
Temperature and salinity in FLY#3 are apparently adrift. Preliminary checks using Charles Darwin CTD data suggest a deviation from the 2003 calibration despite no change in sensors.	Recalibration using the CTD data from the 2005 cruise.	
On changing the shear probes, disparity between old and new probes was identified, which is more accurate.	Suggest returning 'old' shear probes for re-calibration to investigate any drift and to ascertain whether they have faults.	New shear probes only used post Penzance.
Despite the failures in the FLY, the availability of a spare instrument has in one way or the other allowed us to continue data collection. The weak link is potentially the winch and line thrower system which has been performing badly at times.	Hydraulic oil change. New switch. New springs for line thrower.	
The FLY capture laptop is extremely slow at times and can be temperamental. A large number of false bottoms have been recorded.	Review capture software and hardware. Suggest re-written software that can be used in a more modern system. Re: the current	

	Visual Basic program is only compatible with Windows 98.	

Equipment losses

The attempted recovery of SOS ADCP pyramid mooring, position 49°51.231'N 07°56.873'W was unsuccessful. Recovery was attempted at 0500 04/08/05 in relatively calm sea conditions with moderate swell. No communication was made with the release mechanism in the mooring. Numerous attempts at and around the deployment position were unsuccessful and a wider survey of the area, covering >0.5km in all directions failed to make any communication with the device. The recovery was aborted at 0756 after consultation with JHS and discussion with John Wynar (UKORS) and Jonathan Sharples (PSI). This loss of data and equipment is highly regrettable added to the premature recovery of the bedframe ADCP at the 'bank 1' site by a trawler on the 31/07/05 and the later discovered disappearance of the temperature logger mooring at 'bank 1'.

A review of contingency recovery of the 'trawl proof' pyramid moorings must be made. Consultation with POL could prove fruitful; apparently a second release mechanism is used with a further option of a 'free' buoy to help recovery is often used by them (Phil bosun).

Detection of the unit could also be assisted by the use of an acoustic location device, similar to that installed on the CTD rosette in case of loss.

The loss of 2 temperature logger moorings at sites U2 and 'bank 1' and the loss of a 'hippo' guard buoy at 'bank 2' highlights the dangers of deploying moorings in areas of busy marine traffic, although severe weather conditions may also of played a role. Heavy fishing was certainly evident in the Jones Bank area throughout the data collection period. The rescue of the two 'hippo' buoys, one

by the navy and one by the RRS Charles Darwin could help to reveal how the buoys broke their moorings and hopefully lessons can be learnt from this.

NB: NAVTEC warning to mariners was received very late (near end of deployment) by PM, check to see when issued and how often.