River Dee Estuary recovery cruise report April 2007
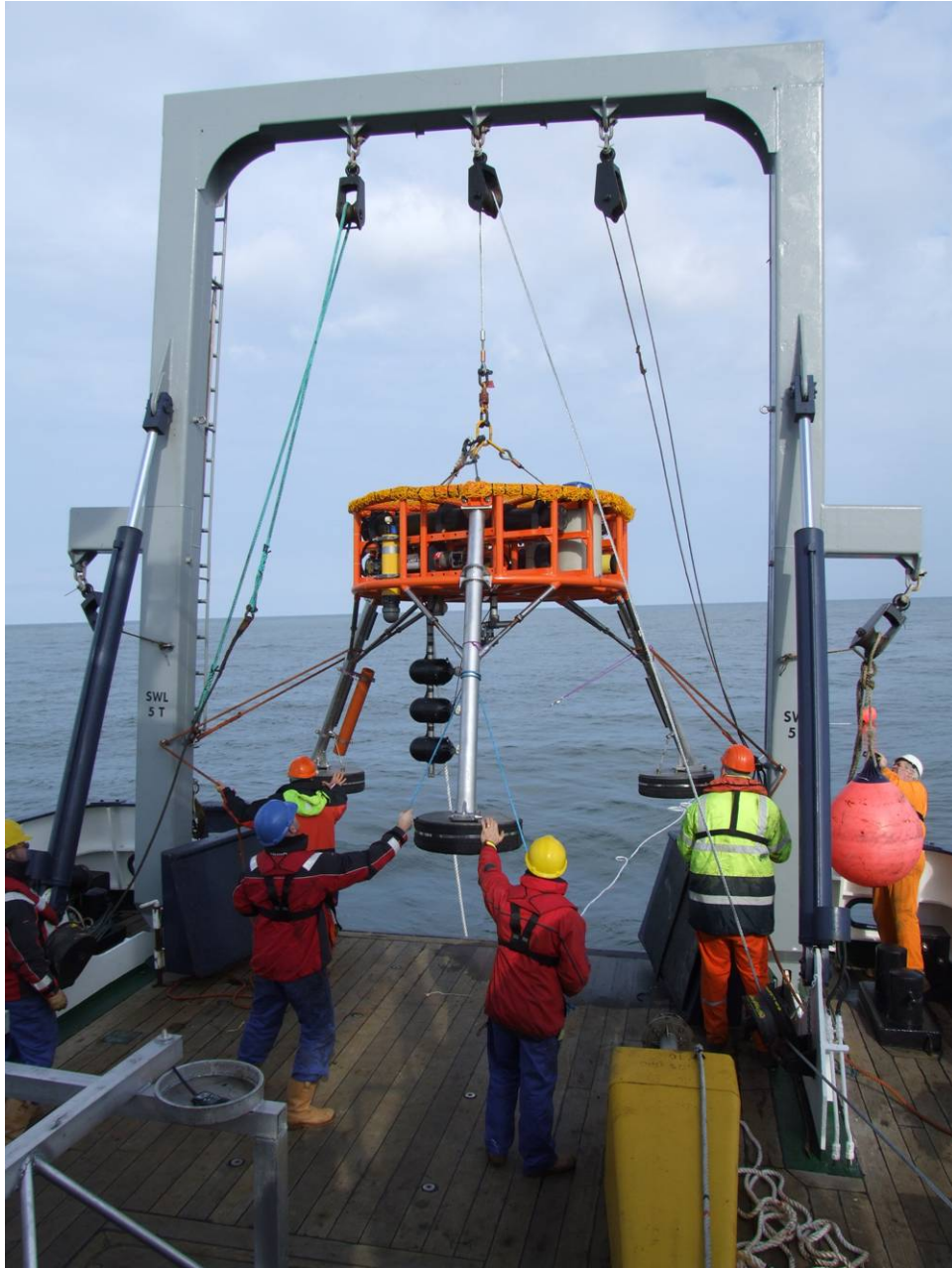
Document History.

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Contents.

Introduction.

This report covers the recovery of equipment deployed during the Dee Estuary 2007 experiment with other relevant details noted e.g. problems encountered which may affect data analysis. It is assumed the reader will also have access to the counter-part report, covering the deployment itself. Note that all datasets have now been archived to POLC's DiskX tape robot system for safety and were possible, distributed to interested parties for analysis.

Cruise Diary.

Sun, 15/4/2007.
- POL team meet up at Vittoria Docks, 7:00am-7:30am.
- Vehicles loaded with equipment etc.
- Travelled directly to Menai, to load ship with gear.
- Bottom frames built up on deck. ADV G321+A840 noted to have possible 55deg compass misalignment during predeployment final checks. ADV was set to XYZ coordinate system with x-axis transducer aligned with beam 3 on the ADCP. ADV was set with sync disabled, 20minute bursts every hour, 16Hz recording rate, velocity range 4 (=2.5m/s), XYZ coordinate system, Compass Offset of 0deg, and to start at 12:00pm (GMT) 16/4/2007.

Mon, 16/4/2007.
- Sailed from Menai, 8:00am BST.
- Recovered ADCP frames and deployed the others.
- One of ADCP frame 10MHz OceanProbe ADV unit probe heads, was damaged on recovery. Initially believed to be due to impact against side of ship. Later found to have been due to recovery line rope wrapping around the probe head itself. Probe was damaged beyond repair.
- Waited outside Hilbre from 3:30pm due to low tidal conditions making water to shallow to get into Hilbre channel.
- On station in Hilbre Channel at 7:15pm.
- First of 25hr CTD station measurements started at 8:00pm BST.

Tue, 17/4/2007.
- Last CTD station measurement taken at 4:00pm.
- Up-anchored at 4:35pm (BST) and left station at 4:50pm.
- Recovered Triaxis buoy at 5:00pm (BST).
- Arrived at STABLE3 site, 5:30pm (BST).
- Recovered STABLE3 at 5:48pm (BST).
- Waited at STABLE3 site until water high enough to leave the Hilbre channel.
- Left Hilbre and sailed to Vittoria Docks, Birkenhead at 8:00pm.
- Madog sailed up and down river Mersey outside Birkenhead Docks for long time until allowed to go in. Wait was due to another ship also using the Birkenhead Docks.
- Finally moored up for the night at Vittoria Dock, 12:30am (BST).

Wed, 18/4/2007.
- Unloaded Madog of STABLE3 etc. Loaded up with more frames to deploy on COBS section of cruise. 6:30am (BST) to 8:00am (BST).
- Left quayside at 8:30am (BST).
- Left Birkenhead dock gates at 9:30am (BST).
- On-site at Merseybar and recovered ADCP frame at 12:40pm (BST).

- Sailed to Welsh channel CTD station, arriving at 1:45pm (BST).
- Started first CTD station measurements at 2:00pm (BST).

Thur, 19/4/2007.
- Last CTD station measurement taken, 8:00pm (BST).
- Recovered mini-STABLE.
- ADCP frame recovered.
- One Smartbuoy deployed and another recovered.
- CTD grid stations started at site 22, 10:00pm (BST).
- Between stations, mini-STABLE, ADCP and Smartbuoy frames were dismantled on deck after shutting the instruments down.
- From mini-STABLE :-
- ADV G412 had recorded 376023661 bytes to file DEE07002, created 2007/03/12 18:24:44.
- ADV G250 had recorded 376023661 bytes to file DEE07001, created 2007/03/12 18:22:48.
- ADV G258 had recorded 376023661 bytes to file DEE07001, created 2007/03/12 18:21:08.
- Took fluorimeter off Smartbuoy and gave to Chris Balfour to clean-up and pack away.
- Took ADCP and Seabird CTD off ADCP and gave to Chris Balfour for data recovery.

Fri, 20/4/2007.
- Last CTD grid station measurement taken 10:30am (BST) at station 34.
- Packed gear away between station measurements.
- Sailed back to Menai.
- Offloaded gear from Madog into POL vehicles.
- Left Menai and returned to Vittoria Dock to unload some equipment.
- Rest of equipment returned to KSA Annex in POL van and unloaded there ready for Monday.

Instrument Recovery - Mini-STABLE

These instruments were recovered on-board the Madog during the cruise. No data was recovered then, only checks were performed to see what if anything had been recorded. Data was recovered post-cruise at KSA for all instruments except for ABS3 which was returned to POL for this task. **Note that ADV probe B331 was top of the central pole, B252 was in the middle with B233 at the bottom.**

ADV G412.
- Data recovered by Richard Cooke.
- Following details noted during post-deployment checks :-
- 890 bursts, 376023661 bytes recorded.
- Battery packs measured 16.38v and 16.39v
- Compass and pressure recorded.
- Data looked OK visually when viewed using ViewHydraPro.
- System loaded with cal file B331H. Transform Matrix loaded was

2.636	-1.262	-1.375
-0.044	2.310	-2.265
0.344	0.345	0.345

- Set for side orientation.
- System recorded using ENU coordinates.
- BINARY output format was selected.
- Primary o-ring seal at the electronics end of yellow canister was noted to have been damaged slightly, possibly from presence of grit. The o-ring was replaced with new seal.
- Secondary o-ring was visually OK.

ADV G250.
- Data recovered by Richard Cooke.
- Following details noted during post-deployment checks :-
- 890 bursts, 376023661 bytes recorded.
- Battery packs both measured 16.29v.
- Compass and pressure recorded.
- Data looked OK visually when viewed using ViewHydraPro.
- System loaded with cal file B252H. Transform Matrix loaded was

2.626	-1.191	-1.435
-0.065	2.317	-2.248
0.345	0.345	0.345

- Set for side orientation.
- System recorded using ENU coordinates.
- BINARY output format was selected.
- Primary o-ring seal was visually OK. This system does not have secondary o-ring seals.

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ADV G258.
- Data recovered by Richard Cooke.
- Following details noted during post-deployment checks :-
- 890 bursts, 376023661 bytes recorded.
- Battery packs measured 16.28v and 16.29v.
- Compass and pressure recorded.
- Data looked visually OK when viewed using ViewHydraPro.
- System loaded with cal file B233H. Transform Matrix loaded was

2.677	-1.328	-1.351
0.031	2.285	-2.313
0.344	0.344	0.344

- Set for side operation.
- System recorded using ENU coordinates.
- BINARY output format was selected.
- Primary o-ring seal was visually OK. This system does not have secondary o-ring seals.

ABS3.
- Data recovered by Richard Cooke.
- Shutdown system OK. Last day recorded was 26/4/2007 indicating still recording OK when shutdown. Note that last few days of recording are while it was out of water and are not of use.
- Battery pack measured 13.11v.
- ABS timestamps show it was deployed 13/3/2007 at 6:00am GMT.
- 44 days of data recorded on HDD and recovered, first 38 days represent actual deployment, the rest are post-recovery due to delays in shutting the system down. Burst data recorded while system in water has been extracted and distributed to Peter Thorne/Ben Moate.
- Visually the data looks OK from initial checks using MatLab.

LISST-ST.
- Data recovered by Richard Cooke.
- Unable to communicate with system over RS232 using the system's remaining battery power.
- Needed to use mains power supply to operate the system as battery pack found to be exhausted.
- Noted that system's laser was still operating even though the battery power was too low for RS232 comms. System was halted using mains power – laser stopped after this.
- Noted presence of iron filings build-up around mechanical on/off switch on system. Not sure of source as pressure casing was not damaged.
- Recovered 2102080 bytes of data from system. Start date was 03/15/2007 06:00:00, assumed to be GMT. Couldn't verify clock drift due to clock losing settings from the low battery power. Op mode, start condition and stop condition were all listed as code 02.

ADCP-6489.
- This is being handled by Chris Balfour.

UEA Sediments trap.
- This was recovered and is at present in the POL Sediments Lab awaiting analysis.

Marine Electronics line scan ripple profiler.
- This is being handled by Paul Bell.

Instrument Recovery - STABLE3.

The STABLE3 instruments were recovered, at Vittoria Docks, post-cruise. Data was downloaded at KSA. **Note that ADV probe B285, with OBS T8193 and CT sensor 7216 were top-most on the central pole, ADV probe B281 with CT sensor 7217 were in the middle and Adv probe B292 with OBS T8195 plus CT sensor 7218 were at the bottom.**

ADV G358.
- Data recovered by Richard Cooke.
- Noted the following during post-deployment checks :-
- 944 bursts, 417280813 bytes recorded.
- The velocity data looked visually OK when viewed using ViewHydraPro.
- Battery packs both measured 13.42v.
- System loaded with cal file B292H, downwards orientation.
- System had been connected to probe head B285 instead of B292 so wrong cal file was loaded and needs to accounted for.
- Transform Matrix loaded was

2.580	-1.360	-1.219
0.045	2.224	-2.271
0.345	0.345	0.345

- System set to record from external sensor with OBS3+ sensor s/n:T8195 physically attached.
- System set to record from external PAROSFREQ type pressure sensor with the external Digiquartz pressure sensor from G350 (now retired), physically attached. Note that no cal file for the pressure sensor was loaded before deployment. This file is needed to analyse data recorded.
- System was set to record using XYZ coordinates, with binary output format.
- Primary o-ring seal at the electronics end of the yellow canister was visually checked as OK.
- Secondary o-ring seal also checked out visually as OK.

ADV G365.
- Data recovered by Richard Cooke.
- Noted the following during post-deployment checks :-
- 945 bursts, 290397051 bytes recorded.
- The velocity data did not look right when viewed using ViewHydraPro. No tidal cycle information could be viewed and the data looked like only background noise had been recorded. Note that can be compared to a dataset from Dee06 deployments which was later identified as having been corrupted during recording to CF card.
- Battery packs both measured 16.21v.
- System was loaded with cal file B281H, side orientation.
- System had been connected to probe head B292 not B281 so wrong cal file was loaded and needs to be accounted for.
- The Transform Matrix loaded was,

2.582	-1.273	-1.309
-0.006	2.242	-2.234
0.345	0.345	0.345

- System set to record from internal compass and pressure sensor even though these did not exist. This is a problem encountered during pre-deployment preparations, as the system would not allow the settings to be changed and complained that the compass was present. It is believed that a DIP switch setting on the electronics logger needed to be changed but there was no time for prior to deployment. The software did warn that values of 0.0 would be recorded for the compass value.
- System was set to record using XYZ coordinates, with binary output format.
- System was not set to record from external sensors, external pressure sensors nor compass.
- The system did not have an OBS3+ sensor attached as there was no connector for it.
- Primary o-ring seal at the electronics end of the yellow canister visually checked out as OK.
- Secondary o-ring seal also checked out as OK.

ADV G355.
- Data recovered by Richard Cooke.
- Noted the following during recovery :-
- 945 bursts, 362973051 bytes recorded.
- Velocity data looked visually OK when viewed using ViewHydraPro.
- Both battery packs measured 12.24v.
- System was loaded with cal file A285H, downward orientation. Note that A285H is the correct file for probehead B285. The difference in prefix letters is down to a typo at manufacture.
- System was connected to probehead B281, so the wrong cal file was loaded and needs to be accounted for.
- The Transform Matrix loaded was,

2.604	-1.331	-1.274
0.0062	2.207	-2.268
0.345	0.345	0.345

- System was set to record from an external sensor, with OBS3+ s/n:T8193 physically attached.
- System was not set to record from an external pressure sensor, although for some reason the system was set for a PAROSFREQ type sensor as installed, data is indicated as being recorded and the ViewHydraPro software complains of no pressure cal file being loaded. No external pressure sensor was physically attached. This is something to investigate before the next STABLE3 deployment.
- System was set to record in XYZ coordinates using binary output format.
- Primary o-ring seal at the electronics end of the yellow casing visually checked out as OK. Noted large amount of dirt gathered by primary o-ring seal, preventing it from getting past to the secondary o-ring.
- Secondary o-ring seal also checked out as OK.

LISST100.

- Data downloaded by Richard Cooke.
- Battery pack was exhausted. Needed mains power just to interrogate the system as per the LISST-ST on mini-STABLE.
- Clock drift could not be verified as low battery power meant the clock lost it's settings.
- System recorded 2102080 bytes of data – now downloaded.
- Op mode, start condition and stop condition all set to mode 02.
- Recording started 03/15/2007 06:00:00 – assumed to be GMT.
- Noted the same laser running issue as for the LISST-ST, despite the battery power being too low even for RS232 comms.

MC7 CT logger.

- Data downloaded by Richard Cooke.
- System appears to have recorded OK. Note that USB interface on this newer generation unit is actually only equivalent to an RS232 serial link and still took four days to download data running at 115KBaud.

ABS1.

- Data downloaded by Richard Cooke.
- System battery pack was found to be completely flat when system examined. Battery pack measured at 9.22v c.f. 15v (nom) or 16v measured prior to deployment. No excessive current drain was noted from the bench power supply used to power system up during interrogation. It is being assumed at the moment that the battery pack itself developed a fault during the deployment.
- Last date recorded was found to be 31/3/2007 c.f. deployment date of 15/3/2007.
- Recovered 16 days of data from the system, which provisionally looks OK from a preliminary analysis using MatLab. More will be known once Kt values for the system are calculated by Peter Thorne and Ben Moate.

Anderaa ADCP.

- This is being handled by John Kenny.

Marine Electronics 3-D ripple profiler.

- This is being handled by Paul Bell.

RDI ADCP on gimbal mount.

- This is being handled by Chris Balfour.