MERP minicruise PQ8/15 cruise report

Thursday 6th August 2015 14:30-00:30

Martin Lilley, Pennie Lindeque and Angus Atkinson

Plymouth Quest – Andy Perkins, Jim, Gary and Andy as the regular crew.

The August Pelagic-minicruise for the MERP project combined data collection for both MERP and a microplastics project in variable conditions. A late-afternoon low water meant that an early departure from Sutton Harbour was required. An improving forecast meant that sampling within Plymouth Sound was a sensible opening, obtaining 4 stations for the microplastics project, before venturing out to L4. Conditions were initially Force 5 with a 2m swell, but declined to a F3 with underlying swell by the end of sampling.

Sampling at L4 began at 17:30 with two jellyfish nets (500µm, 1m^2, ~1000m double-oblique profile, 20 min duration). Neither net yielded much in the way of visible jellyfish or fish larvae. This was synonymous with the previous Monday's L4 WP2 net which had siphonophores, Noctiluca and Echinoderm larvae. A pair of WP2 200µm and 63µm nets followed, as with previous cruises. Two more jelly nets and two more pairs of vertical nets completed the day sampling. Each net sample was split in half, with half frozen in liquid nitrogen and kept at -20^oC. Half nets were preserved in ethanol and formalin for later processing. A few fish larvae were picked out and frozen for genetic analysis, while Agalma siphonophores were observed but not preserved.

One further microplastics net at L4 yielded an additional three fish larvae for freezing.

Sunset was 20:55 and last light 21:30, at which point we started sampling again. The same sampling order followed with a few siphonophores and fish larvae visible. The final jelly net caught a 15cm *Chrysaora hysoscella* (common at this time of year) compass jellyfish. Lappet tissue was taken for genetic analysis and its stomach contents were flushed out with filtered seawater and pipetted into a tube for freezing. The last nets came out of the water at 23:20 and we steamed back to Plymouth. Return to Sutton Harbour was by 00:25.

Notes from the sampling:

With no jellyfish to pick out there was plenty of manpower to pre-label bottles and keep on top of recording, which had been a problem on the previous minicruise. It would be possible to pre-label bottles, but time would be spent searching for the right tube or bottle for that sample.

Use of a dry-shipper again caused problems and resulted in several broken Falcon Tubes when they were tipped out. Use of a stocking inside the shipper might be useful, but plastic bags just stick to the inside and become immovable. The (now repaired) large nitrogen dewar worked well for freezing the samples and still had Nitrogen in it nearly 24 hours after sampling.

A hand-lens might be useful for future work in order to look in closely at the sample to identify the main plankton species present.

The extra buckets added since the last minicruise were very useful. Having three of three different sizes and plenty of 1-2l beakers for splitting the samples was effective.

Angus suggested that if the vertical nets were done before the jelly nets then this would mean more time for splitting and sorting the jelly-net samples. This would probably work well, although we'd have to wait a little longer before deploying the nets on the night sampling. This change will probably be implemented on the next sampling trip.

Discussion with the crew revealed that the winch drum gets narrower as the cable gets paid out. This means that a constant drum motion will pay out more cable per rotation at the beginning and end of the tow, with a slow speed in the middle. For an oblique tow this means that the net will move though the water more rapidly near the surface than at depth, and therefore spend less time at the surface. This is important in comparing vertical and oblique net tows. Species with high abundance in an oblique net compared to the vertical WP2 could be expected to inhabit the deeper part of the water column; while species with low abundance relative to the WP2 would be nearer the surface. Noticeable differences have been observed between day and night oblique nets indicating vertical migration.
Importantly the crew are adamant that the net is getting very close to the seabed and would have sediment in it if they deployed much line. A depth-logger may be used in future to confirm this.

Sample analysis:

Analysis of Formalin-preserved samples in the laboratory have observed major differences between the WP2 and jelly net types and also between day and night sampling of the whole water column. Whether these differences are due to variable avoidance of the two net types, the method of sampling or something else have yet to be resolved.
It is also important to note that species such as the ctenophores appear to be under-represented in the Formalin samples and will therefore need to be processed immediately on board wherever possible.
All Formalin samples (WP2 and jelly-net) collected to date have now been processed for jellies and fish larvae.

Combining the biomass estimates from the WP2, Jelly-net and on-ship measurements is to follow.