MERP minicruise PQ11/15 cruise report

Monday 23rd November 2015

Martin Lilley, Pennie Lindeque and Maddie Steer (MRes PlymUni/PML)

Plymouth Quest – Andy Perkin (skipper), Garry, Jim, and Andy as crew.

The November MERP minicruise went out on the scheduled day, making use of a short weather window in the cycle of November storms which have plagued the UK in recent months. A small high pressure over the weekend created calm conditions for Monday 23rd November 2015, which then built again to a moderate swell with wind and rain by midnight. Tides affected when Plymouth Quest could leave for the regular L4 sampling and in turn affected departure time of the MERP minicruise until 13:45. Sampling during daylight was constrained by the short time window between arriving at L4 at 14:40 and sunset at 16:25, necessitating some pruning of the usual two hour length of the sampling. All ethanol and formalin samples (500µm Jelly net, 200µm WP2 and 63µm WP2) were conducted first in good daylight and the remaining frozen samples (and those for picking animals out of) were done as the sun went down (finishing at 16:35). Therefore daytime sample ID 3 and 4 for all nets may have a slightly different diversity to samples 1 and 2. An additional jellyfish net was added for Maddie Steer to collect fish larvae. As this net came to the surface a dolphin was playing around the net frame. Chaetognaths and decapod-type larvae were the main species observed in these samples, with few siphonophore bits (or maybe small Muggiaea) and no large jellies.

In the sampling break dolphins were circling the boat, feeding on small sprat that had been attracted to the deck lights. Six dolphins were seen together, along with many seagulls picking fish from the surface. The fish themselves were not visible until picked up by the birds.

Sampling restarted at 17:55 as the swell started to build a little, with the first net on deck at 18:15. Sampling proceeded smoothly, observing more fish larvae than previously seen alongside the chaetognaths and arthropods. Once again all the preserved samples were done first, with the picking samples at the end of the program. This can only work successfully at this time of year because of the lack of organisms to pick out of the nets. A few fish larvae were taken from the jellyfish nets and preserved individually. Sampling for MERP was concluded at 19:45. Once again an extra jellyfish net was done for Maddie and a third one as we steamed back in. Unfortunately the tides prevented re-entry to Sutton Harbour until there was enough water over the sill. We finally docked at 23:30.

Additional notes:

The depth recorders were again fitted to the jelly net in order to observe its trajectory through the water. Most jelly net tows were to 30-35m again, however there were some anomalies. One tow went to 55m (very close to the bottom, even at high water), while being towed at a slower Speed over ground (0.4kt), but a similar speed tow only went to 24m. Why one net went much deeper over the same 10 minute timescale is hard to explain, although little things appear to change the trajectory significantly. A bubble in the cod end may influence the maximum depth for instance.

Would a small weight in the jelly-net cod end result in a deeper tow and make the cod end sink immediately? The calmer conditions (compared to PQ9-15) appeared not to affect overall depths with similar depths being obtained. This is positive, because it means that previous sampling dates are likely to have had comparable tows. Calculations also suggest that it is the distance towed that affect the volume of water filtered more than the depth, but of course net efficiency is most likely to have the biggest effect.
Finally, the addition of a 100 µm net to the wire significantly affected the overall tow depth, with Jelly + 100µmWP2 tows only descending to 14-25m depending on ship speed.

Two and a half experienced people was about right for managing the sample regime in the winter months when there wasn't much to pick out. In the Spring a third pair of hands will be invaluable, but it may be Maddie will be experienced by then if she wants to come out for her own samples too.

The 100µm sieve didn't make it into the equipment boxes, so all the 200µm nets were filtered through another 200µm mesh for preservation. They would normally be filtered onto a 100µm sieve. This should not have affected the number of species or diversity obtained.

As part of the microplastic work of Pennie and Maddie, they wanted to see if there were microplastics in fish larvae, and to know how many were in the water column at the same time. As a result, on their jelly nets, a 100µm WP2 net was attached to the cable about 5m above the jellyfish net using a strop. This appeared to work nicely (except for reducing the depth sampled) and made for inter-comparisons between the fish larvae and the prey field. However, such a system would also work very well for comparing the jellyfish net and WP2 nets and their catchability in the top half of the water column. In the Spring this might be an ideal way to get samples which were conducted in exactly the same patch of water and to compare the species diversity and numbers caught. Notably the WP2 is towed much further than normal (1000m compared to 45/50m) and catches considerably more plankton. This would be slow to filter when plankton volumes are dense.

There were lots of chaetognaths in these samples. I don't know if these predators change in size much over the course or the year, but it might be worth working through their lengths and biomass for the jelly-net comparisons and maybe even going back through the past samples to get an estimation of their variability.

There were no scyphozoan jellyfish observed, despite a glut of *Pelagia noctiluca* back on 2nd November at L4, and few hydrozoans jellies either. Some of the plankton appear to be showing signed of an autumn bloom with increased numbers of small copepods, arthropods, fish eggs and some larvae, but the jellyfish have not responded as yet.

The next cruise is planned for late January, with the remaining few during the spring bloom period (possibly late February, March and April). April will complete the full year cycle and give a second opportunity to collect more genetics samples. To date collections have been made in February 17 (trial run), April 30 (1st consistent sampling programme), June 23, August 6, September 23, and November 23 2015.