

## **Suggestions made by WP leaders for potential studentship projects**

### **WP1 consortium suggested areas for studentships:**

- Observations on organic matter (OM) distributions, stoichiometry and cycling at key areas (seasonally stratified, permanently mixed) in the North Sea to compare to model output from the same region. Organic matter cycling in coastal waters (permanently mixed, possibly influenced by fresh water) is not currently covered by the SSB programme, but is arguably a key area of uncertainty in models of shelf sea biogeochemistry. The observational campaign could use the existing SmartBuoy sampling platforms that are being used in the current SSB pelagic project, as well as ships of opportunity. This would not only improve our mechanistic understanding of OM cycling in shelf seas but also provide an additional database for the modelling package.
- Utilisation of dissolved organic matter by autotrophs (i.e. how important is DOM compared to inorganic nutrients) and heterotrophs. This is being touched on, but there is scope to broaden.
- Use of metagenomics in order to understand the bacterial and archaeal groups undertaking CO<sub>2</sub> and N<sub>2</sub>O production and how these vary spatially and seasonally.
- Air-sea gas fluxes will be estimated during SSB, particularly from the process cruises in the Celtic Sea. There is scope to broaden this component towards addressing the role of surfactants in altering gas flux estimates, including meteorological and seasonal variability. The work could take advantage of cruises during SSB, and also work at the E1 channel buoy.
- The use of remote sensing to estimate primary production, including developmental work on techniques and validation against SSB process cruise data. A related topic that would be very useful is more detailed study of phytoplankton photophysiology alongside the C uptake work on the process cruises.

### **WP2 consortium suggested areas for studentships:**

- Mechanisms of benthic-pelagic coupling – explicitly the processes that link the two compartments, with emphasis on biological linkages.
- Exchange of nutrients, C and Fe as mediated by organism activity and behaviour. WP2 consortium will do an element of this, but it requires detailed study of how fauna (functional roles, changing assemblage structure, food web linkages) affect the stocks and flows of nutrients.

### **WP4 consortium suggested areas for studentships:**

Projects which help to address process model developments identified in Figure 1 of WP4 Summary, either by generating new knowledge and/or contributing to model development.

Specific topics of interest could include

- 1) Adjunctive processes in sediments

2) Mixotrophy and its role in controlling shelf seas biogeochemical cycles

3) Biogeochemical role of meroplankton.