Global distribution and surface activity of macromolecules in offline simulations of marine organic chemistry

Objective:

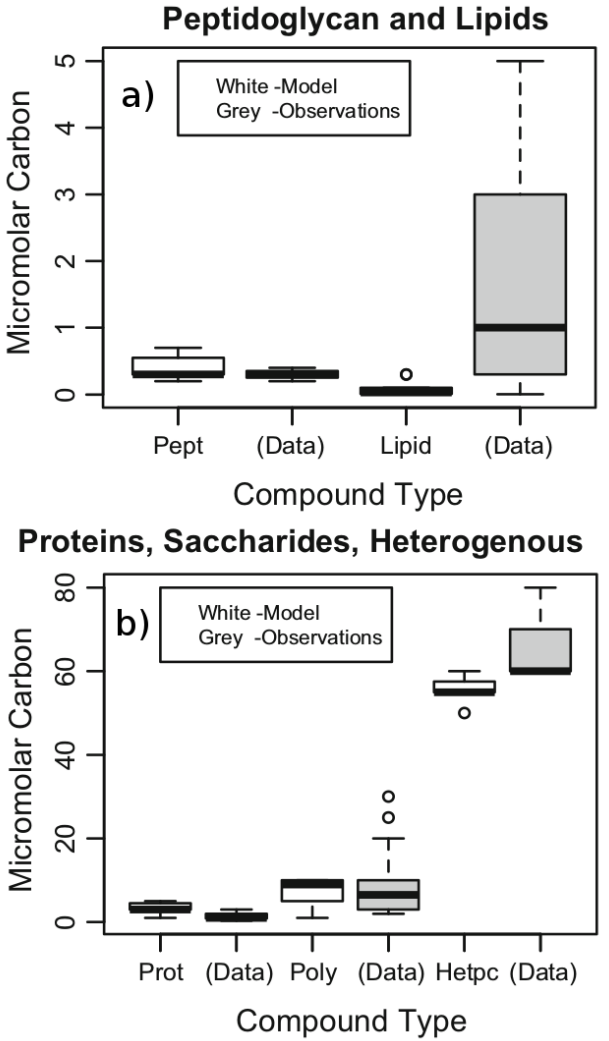
Characterize the global distribution and activity of organic macromolecules at the ocean surface using a mechanistic marine systems model.

Approach:

- We conducted offline simulations of the Parallel Ocean Program (POP) with the Biogeochemistry-Ecosystem-Circulation (BEC) package to obtain ecodynamic tracer fields.
- Seasonal surface concentration distributions of organic macromolecules were calculated from these tracers.
- Fractional surfactant coverages and surface excess concentrations were also estimated.

Results/Impacts:

- Distribution estimates were found to agree with available measurements within an order of magnitude.
- Results can be used for planning field experiments and assessing potential response of surface chemical behaviors to global change.



Comparisons of modeled versus measured global macromolecule concentrations.

Ogunro, Oluwaseun O., Susannah M. Burrows, **Scott Elliott**, Amanda A. Frossard, **Forrest M. Hoffman**, Robert T. Letscher, **J.Keith Moore**, Lynn M. Russell, **Shanlin Wang**, and Oliver W. Wingenter (2015), Global distribution and surface activity of macromolecules in offline simulations of marine organic chemistry, *Biogeochemistry*, 126(1–2):25–56. doi:10.1007/s10533-015-0136-x.