

Bathypelagic working group Biogeochemical cycling (Dan Repeta)

Elucidate the underlying mechanisms of physical, chemical and biological processing of organic matter in the bathypelagic, with the goal of determining the relative importance of major processes and the time scales over which they respond.

The bathypelagic is understudied!
Many of us relied on data/concepts from the epi- and meso-pelagic!

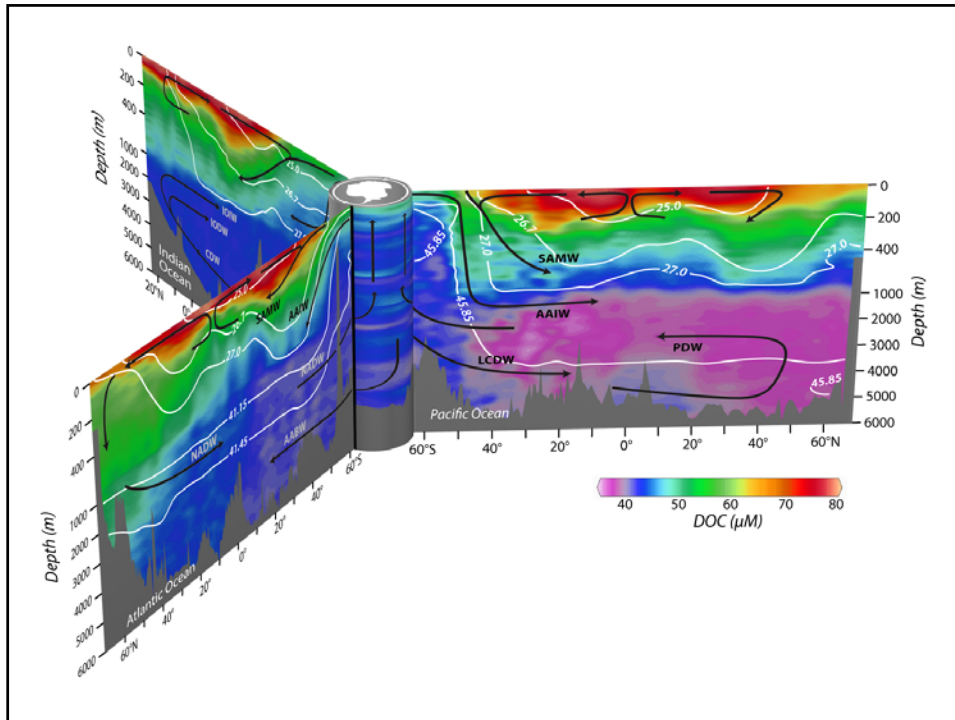
Global distribution of DOC and organic fluorescence in the ocean

Significant deep sea gradients in carbon
and dissolved fluorescence

Identify sites of export and removal

What are the processes involved- abiotic or biotic?
What about DON and DOP?

What sets deep ocean concentrations of DOC?



Radiocarbon and DOC cycling

Current models of DOC cycling are based on four radiocarbon profiles.

RC profiles are consistent with several models of DOC cycling that differ in significant ways wrt the amounts and reactivity of DOC fractions

Important to arrive at a consensus of which model is appropriate-

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Important to arrive at a consensus of which model is appropriate-

Further discuss the hypotheses, data, tests, uncertainties, etc

Microbial degradation of DOM

Experimental approaches to evaluate biological, physical, and chemical processes, and timescales that effect DOM transformation.

Field observations of changing DOM composition and microbial communities-is there a link between DOM composition and microbial diversity?

Advances in the composition of DOM.

DOM ↔ POM transformations

DOM is composed of polymers that can self assemble into gels, which can grow into particles.

Gel formation may affect the reactivity of DOM and its distribution in the ocean

Bacteria can colonize and use gels as a substrate, and may excrete polymers that affect gel formation.

The physical features of the organic matter are critical to understanding its processing.

Models and particle flux

Deep sea is dynamic, and we have new data sets that can be used to develop models and generate hypotheses on bathypelagic cycling.

Need to develop mechanistic and parameterized models of the deep sea.

Importance of particle transformation rates and pathways.

Zooplankton: how large a contribution to bathypelagic respiration and what are they responding to?