



What we learnt from tracing terrigenous organic matter in the Arctic Ocean

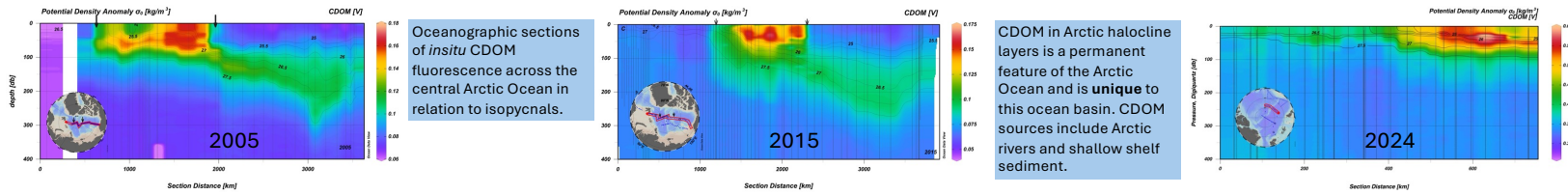


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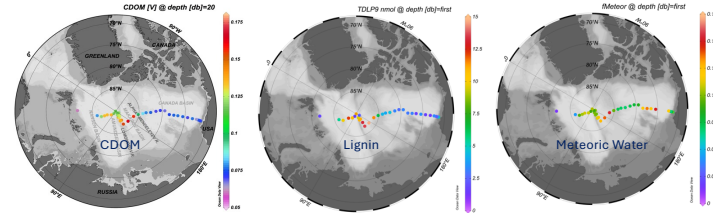


CDOM distribution across the Arctic Ocean over the last 20 years



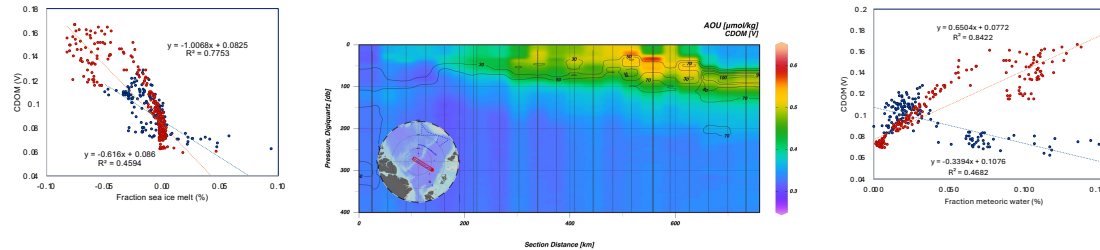
What controls the distribution of CDOM in the Arctic Ocean?

Arctic Ocean CDOM distribution is best explained by sea ice dynamics on a pan Arctic scale as seen in the strong relationship of CDOM to the fraction of sea ice melt based on water isotope values, salinity and nutrient ratios.



Besides the well understood riverine source of CDOM there is another source that also carries a strong decomposition signal (AOU) emanating from the Chukchi Shelf. The negative relationship of CDOM to meteoric water in the Canada Basin suggest that ice melt is included in the meteoric water estimate.

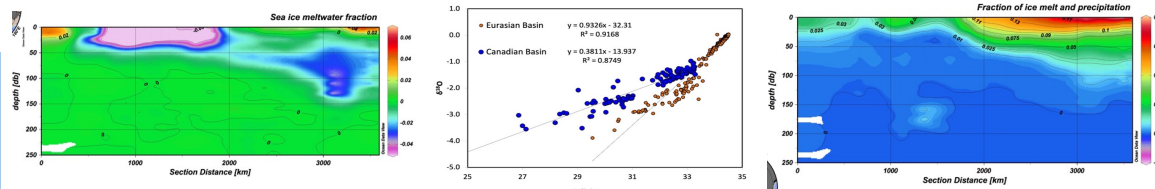
Discrepancies between CDOM, terrigenous biomarker concentrations and meteoric water contributions in the Canada Basin indicate that there are several CDOM sources and that our understanding of water mass origins and freshwater sources is incomplete.



CDOM of terrigenous and sediment origin is injected into the Arctic halocline by sea ice formation on the pan-Arctic shelves. Shelf water salinity determines the density/depths at which the CDOM and halocline are found.

How does the DOM distribution inform on freshwater sources, circulation, residence times and halocline stability?

Replacing the nutrient tracer with CDOM in water mass decomposition modes suggests the classical model underestimates the amount of sea ice melt in the Canada Basin and that there need to be a net transfer of sea ice/melt from the Eurasian Basin to the Canada Basin.



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