Fluorescent dissolved organic matter as a biogeochemical tracer in the Davis Strait

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Climate change affects the Arctic environment with regards to permafrost thaw, sea-ice melt, alterations to the freshwater budget and increased export of terrestrial material to the Arctic Ocean. The Davis Strait, together with the Fram Strait, represents the major gateways connecting the Arctic and Atlantic. Oceanographic survey was performed in the Davis Strait in late summer 2013, where hydrographical data and water samples were collected. Meteoric (f_{mw}), sea-ice melt, Atlantic (f_{aw}) and Pacific (f_{pw}) water fractions were determined. The underlying fluorescence properties of dissolved organic matter (FDOM) were characterized by applying Parallel Factor Analysis (PARAFAC), which isolated three fluorescent components. Visible wavelength FDOM (VIS-FDOM), associated to terrestrial humic-like material, was capable of tracing the Arctic outflow due to high values observed in association to Arctic Polar waters (PW) exiting through Davis Strait. Furthermore, VIS-FDOM was correlated to apparent oxygen utilization and traced deep-water turnover of DOM and also allowed to distinguish between surface waters from eastern (Atlantic + modified PW) and western (Canada-basin PW) sectors. The presented findings highlight the potential of designing *in situ* DOM fluorometers to trace the freshwater origins and decipher water mass mixing dynamics in the region and the potential of FDOM as a biogeochemical tracer.