

Interactive comment on “Carbon dynamics in the western Arctic Ocean: insights from full-depth carbon isotope profiles of DIC, DOC, and POC” by D. R. Griffith et al.

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This paper contributes a complete data set of concentrations, $\delta^{13}\text{C}$, and $\Delta^{14}\text{C}$ for DIC, DOC, and suspended POC depth profiles from two sites in the Arctic. These data are an interesting complement to existing profiles from other major ocean basins. The unique inputs and conditions of the Arctic Ocean as compared to more open ocean sites make this a necessary contribution to understanding the global marine carbon cycle.

A notable highlight is the isotopic signature of suspended POC, of which the Canada Basin has extremely low concentrations. The ^{14}C -enriched signature of suspended

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POC relative to sinking POC potentially indicates significant DIC fixation by chemoautotrophs, particularly at intermediate depths. These observations are consistent with the growing evidence supporting chemoautotrophy in the deep ocean, and provide additional geochemical support to many existing microbiological observations.

The collection of sorbed DOC which served as a 'blank' for suspended POC appears fortuitous in this case due to an in situ pump failing to start. As it resulted in up to 19% of total organic carbon for suspended POC samples (albeit in an area of very low concentrations), future sample collection should include such a characterization of DOC sorption.

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