

Interactive comment on “Strong linkages between surface and deep water dissolved organic matter in the East/Japan Sea” by Tae-Hoon Kim et al.

Anonymous Referee #3

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Major Comments: This study documents dissolved organic carbon (DOC) and total hydrolysable amino acid (THAA) concentrations in the East Japan Sea, and compares these with values from the North Atlantic and North Pacific. The East Japan Sea is a region of deep water formation, and the study describes elevated THAA concentrations in deep waters that they interpret result from export from surface waters. They also assume that the export of THAAs from surface to depth as a source of bioavailable DOM to deep waters. The study also examines ratios of amino acids to calculate a degradation index proxy for degradation of dissolved organic matter. They find little to no increase in the degradation index with depth, and the absolute degradation index is intermediate between values observed at the HOT and BATS locations.

The manuscript is clear and straightforward. The data are largely consistent with prior work on marine DOM, and the conclusions largely follow from the data. My most

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significant concern is that the concluding sentence, regarding the potential decrease in DOM sequestration in the deep ocean with decreasing rates of deep-water formation, is not supported by the observations; this study did not document rates of deep-water formation nor how DOC concentrations have changed through time. The degradation index or %THAA are not precise enough metrics to be able to draw this conclusion.

Section 3.2, lines 23-30: It's not clear that THAA's were preferentially consumed with depth, especially as a fraction of the DON pool. Statistics should be used to evaluate whether the decrease with depth is significant.

Minor Comments: Line 3: Specify that N:P implies $\text{NO}_3^-:\text{PO}_4^{3-}$. As written it is somewhat ambiguous since the study focuses on organic nutrients.

There is some redundancy regarding pigments and cyanobacteria – this is stated at least 3 times, and is probably unnecessary.

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