

Interactive comment on “Different seasonality of pelagic and benthic *Thaumarchaeota* in the North Sea” by N. J. Bale et al.

Anonymous Referee #2

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Because of my speciality, my review focuses on the aspects of organic geochemistry and sedimentology of this paper.

The authors discuss the production, transport and deposition of GDGTs based on a combination of intact polar GDGT and gene abundances in the water column and sediment sample sets. They presented that the intact polar GDGTs varied differently in the surface and bottom water and the surface sediment at different locations. They explain such a spatial and temporal variability by the production of Thaumarchaeota and the transport of sediment particles. The data and discussion are original and worthy of attention. The interpretation on the abundance of polar GDGTs is careful and reasonable, and there is no critical flaw in the parts of methods, results and discussion. I thus recommend this paper for the publication in Biogeosciences.

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Specific comments Section 4.2. The map showing sediment drift pattern in the study area is helpful for readers to understand the resuspension of GDGTs and fine sediment particles. The station 4 is the deepest site in the transect, but low HPH crenarchaeol abundance in November suggests that this site is not a depocenter but a passing point to a deeper part. The map is useful to convince the readers. Line 15 in page 11: “muddy sand” is better than “muddier”. Table 1: I prefer to see a graph showing nutrient concentrations. Table 2: If the authors do not separate clay and silt, the fraction of the size under $63\mu\text{m}$ should be called “clay + silt” or “mud”.

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