

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

R.L. Hansman (Referee)

rhansman@gmail.com

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This manuscript by Bale et al. presents seasonal and spatial differences in the abundance of *Thaumarchaeota* in both the water column and surface sediments of the North Sea using a combination of geochemical and molecular biological techniques. The most novel contribution of this study is the use of specific intact polar lipids (IPLs, in this case hexose-phosphohexose crenarchaeol) to expand upon previous studies regarding archaeal distributions in the North Sea. These data corroborate earlier findings of higher abundances of *Thaumarchaeota* in the water column in winter as compared to summer. The authors provide DNA and RNA abundances of thaumarchaeotal 16S rRNA genes as supporting data, which allows for a comparison between geochemical and molecular biological biomarkers. Sampling surface sediments in addition to the

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water column makes this a comprehensive survey and raises some interesting explanations as to the differences in distribution in the sediments compared to the water column. I would recommend this for publication with the following minor revisions.

Major comment:

Some measure of the statistical correlation between HPH abundance and the molecular data (DNA or RNA abundances) would be helpful. The manuscript addresses the concept of a “fossil” IPL signal in the sediments to describe points of disconnect between the two techniques but it is difficult for the reader to correlate the two measurements by comparing the figures alone. A correlation coefficient much like what was presented for the HPH abundance and chemical measurements should be included to quantify this relationship rather than simply stating they generally agree.

Minor comments:

- The “hexose, phosphohexose” as written with a comma is a bit confusing when reading (the comma starts to imply a list or two separate compounds), so perhaps the use of a hyphen (hexose-phosphohexose) as used in Pitcher et al., 2011 would be more clear.
- pg 4, line 29 - **of** is missing (“At the southeastern edge **of** the Oyster Ground...”)
- pg 7, line 12 - a word should follow this comma, perhaps **then** or **and** (“...in a separate flask, **then** this was repeated...”)
- pg 17, line 18 - confusing word order, could be changed to: “...which has been shown to occur at geographically close locations **to stations 4 and 6** in the southern North Sea due to tidal currents...”

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