

Interactive comment on “Technical Note: Constraining stable carbon isotope values of microphytobenthos (C₃ photosynthesis) in the Arctic for application to food web studies” by L. E. Oxtoby et al.

Anonymous Referee #1

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The manuscript attempts to address the issue around the potential role of microphytobenthos in coastal food webs, a subject which is important not just for the Arctic but many global environments.

While this is a worthwhile exercise I feel the manuscript has several major flaws that need to be addressed before publication:

• The authors present no information on previous studies addressing this issue and why their approach has merit (e.g. see Oakes, et al., 2005. Measuring carbon isotope ratios of microphytobenthos using compound-specific stable isotope analysis of phytol. C7845

Limnology and Oceanography-Methods, 3: 511-519.)

• The authors use $\delta^{13}\text{C}$ of DIC to then model likely $\delta^{13}\text{C}$ of MPB, including certain key fatty acids. This involves several assumptions around growth rate, effect of cell geometry and fractionation due to biochemical pathways, all of which have large inherent variability, as has been shown in numerous studies.

• The authors make no comparison with actual measurements of samples collected at the same time

Thus, I was left wondering how to assess how good or otherwise their technique might be. I feel that for this manuscript to go forward there needs to be some way of assessing how good it is as variation of a few per mil are important when trying to infer between contributions from pelagic and benthic algae.

Interactive comment on Biogeosciences Discuss., 10, 18151, 2013.