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Interactive comment on “Oxygen isotope ratios in the shell of *Mytilus edulis*: archives of glacier meltwater in Greenland?” by E. A. A. Versteegh et al.

Anonymous Referee #1

Received and published: 21 September 2012

This manuscript evaluates the potential use of oxygen isotope ratios in the shells of the mussel *Mytilus edulis* to record glacier meltwater discharge in Greenland. To do so, a field validation experiment was carried out in a fjord in Western Greenland with clear seasonal changes in temperature, meltwater discharge, salinity and $\delta^{18}\text{O}_{\text{water}}$. Variations in $\delta^{18}\text{O}$ of modern shells were compared to changes in water variables (temperature, salinity and $\delta^{18}\text{O}_{\text{water}}$). The experiment was well designed; all sampled shells were genetically identified as *M. edulis*; the sclerochronological validation of the shell records was well made, accurately validating shell growth and $\delta^{18}\text{O}_{\text{shell}}$ equilibrium. The paper is well organized, well written and the data are clearly presented, in a logical and coherent manner. The study fits nicely with the scope of the BG journal.

C4143

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The manuscript should be accepted for publication. I have only minor comments on technical corrections:

Page 12021, line 15: if preserved in the fossil and/or archaeological record

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Page 12021, line 25: Howat et al. (2005) does not appear in the reference list

Page 12024, line 22: remove extra..

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Page 12028, line 13: should be Eq.4 instead of Eq.5.

Page 12029, line 2: remove d from and.

Page 12029, line 14: Could this also be true for shell Akia 10a in 2010, where a light band was observed?

Figure 6: Description of symbols and dashed lines in the legend would help to distinguish between shells. Also, should it not be Ice Fjord 3b instead of Ice Fjord 3a? 3a is supposed to have been excluded from the study.

Interactive comment on Biogeosciences Discuss., 9, 12019, 2012.

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