

Interactive comment on “The effects of environment on *Arctica islandica* shell formation and architecture” by Stefania Milano et al.

Anonymous Referee #2

Received and published: 9 January 2017

Dear authors,

This manuscript represent a substantial amount of work, is scientifically grounded and in the scope of BGD. Given several minor corrections and/or improvements, it should in my opinion meet the criteria for publication in BG.

I have, In particular, two remarks : - A detailed description of the orientation of microstructural units in the different layers of *A. Islandica* shell is clearly missing. Please add a proper microstructural description, be it in the form of a sketch, a figure, a dedicated paragraph, etc.. Also, where are these units located/oriented in the SEM or CRM figure (for example, in figure 5) ? - The comparison with EBSD is maybe not so objective... ? CRM definitely has its advantages, but so does EBSD (mapping of the actual orientations of the crystallographic axis of the crystal lattice). Please consider

C1

removing or rephrasing paragraph 4.2.

In a more general view, I regret that more environmental conditions (salinity, pH) were not tested when the authors had both the specimens and the required setup in place (adding one or two step to the initial temperature experiment wouldn't be so much hard work, compared to the time and effort the authors did put into testing the impact of feeding... ?). This would have allowed to estimate the real usefulness of crystalline orientation as a potential independent temperature proxy.

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-462, 2016.

C2