

Interactive comment on “Temporal variability in foraminiferal morphology and geochemistry at the West Antarctic Peninsula: a sediment trap study” by Anna Mikis et al.

sepulcre sophie (Referee)

sophie.sepulcre@u-psud.fr

Received and published: 17 July 2019

The manuscript "Temporal variability in foraminiferal morphology and geochemistry at the West Antarctic Peninsula: a sediment trap study" by Mikis et al. provides an original work about the polar planktonic foraminifera *Neogloboquadrina pachyderma* in the West Antarctic Peninsula. This study consists of a six-year long sediment trap study, and provides data about the shell fluxes, morphology, and stable isotope variability of *N. pachyderma*. These results allow to document the ecology of this species, for which only a few data exist, and to discuss the influence of various environmental parameters on the observed inter and intra annual variability in the *N. pachyderma* records. A lot of

C1

results are exhibited in the manuscript, and several statistical tools are used to reinforce the interpretation. Moreover, a lot of additional figures and Tables help to understand the discussion. The paper is well-written and easy to read and to understand, with a very nice synthesis given by Figure 9 and explained in Section 4.4. I would suggest to clarify some points in order to improve the quality of the paper, as suggested below:

- p9 l1: Section 4.1: I do not understand why the authors assume that there is no vital effect whereas they have all the data to discuss it;
- p9 l1: Section 4.2: In the first sentence, the authors wrote: "there is no direct control of foraminiferal flux specifically due to seasonal changes in water column conditions" whereas in the Results section 3.1 they describe that "Nps test flux generally ranged over two orders of magnitude from zero in winter months to over 300 tests m⁻² day⁻¹ in summer", could you clarify this point?;
- p10 l4-6: Section 4.3.1: I do not understand why the authors discarded the size-specific kinetic/metabolic effects on $\delta^{18}\text{O}_{\text{np}}$;
- Section 4.4 : maybe the authors could add some informations about the seasonal cycle of the diatoms production in the area, is there any literature about that?

As more general comments:

- I think that the $\delta^{13}\text{C}$ record could be better interpreted/used: is there any relationships with the chlorophyll maximum ? With the nutrient proxies ? The primary productivity ?
- You should discuss the potential impact of the carbonate ion concentration on the shell thickness as well as on the $\delta^{18}\text{O}$;
- What consequences the results of this work can have for paleoclimate studies ? To finish, a very small error appears p7 l18: "peaks" written 2 times.

Despite these few comments/suggestions, I think this paper is a very nice contribu-

C2

tion to the better understanding of the carbonate productivity in this area, and to the ecological constrains on *N. pachyderma*.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-19>, 2019.