

## ***Interactive comment on “Quantifying the effect of seasonal and vertical habitat tracking on planktonic foraminifera proxies” by Lukas Jonkers and Michal Kučera***

**L. Skinner (Editor)**

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Dear Lukas and Michal,

I would like to invite you to prepare a full response to the review comments received so far, accompanied by a suitably revised manuscript if you so wish. These review comments cover a number of specific points, which you should strive to address. However they also dwell on two main themes: the need for more thorough statistical analyses; and the need to place your study more squarely in the context of previous work. I would add to this a further proposal to delve deeper into a discussion of what ultimately can be achieved in light of your results, and to add clear detail to your proposals regarding the possibility (if indeed this exists) of improving the accuracy of palaeoceanographic

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reconstructions and/or data-model comparisons. My impression is that the latter are currently only vaguely described.

The issue of relevant previous work is always a tricky issue to address, given the depth and interpretative nature of the literature; however I do tend to concur with the comment that the manuscript seems often to 'preach to the converted' regarding the importance of taking into account habitat bias in the interpretation of foraminifer proxy records, in particular for planktonic species. I also agree that for a paper on such a well-known (if also often completely ignored) issue, the literature review is rather sparse. I would therefore ask you to consider taking this opportunity in revising your manuscript to amplify on this aspect, e.g. for the benefit of readers who will be well aware of the issue, but perhaps not all of the key literature on the topic.

Of course, a full literature review of a topic is not a prerequisite for any given paper on that topic (and is not what I would propose you undertake); however, I suspect that in this case the issue comes to the fore in light of the apparent lack of progress in developing a 'solution' for dealing with the issue of habitat bias in planktonic foraminifera. In this regard, one might argue that there are two schools of thought: one that proposes to 'fix' foraminifer proxy records by correcting for habitat biases; and another that proposes to accept them (along with their ultimately cryptic nature) and to detect and/or 'employ' them as they arise, even if they cannot be known a priori. It seems that the manuscript currently makes a strong point that habitat biases are real (which arguably we already knew), as well as much weaker point regarding what is to be done (or can be done) in light of their existence. I would encourage you to consider engaging in a deeper discussion of the latter issue, as I think this would lend the manuscript greater force.

In order to illustrate my proposal, I would refer to the exclusion of *G. bulloides* from the analysis: this species does not show the 'fingerprint' of habitat bias as defined in the manuscript, and yet it does have a clear habitat bias. This may illustrate a shortcoming of the approach taken, with respect to accounting for habitat bias (or how

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it has been 'modeled'); namely that it does not address habitat bias that results in fixed deviations from the annual mean for example. Further concerns might arise with respect to accounting for habitat bias when considering proxy reconstructions of past climatic change and the occurrence of 'non-analogue' situations (e.g. strong seasonal perturbations, or stratification changes). Can your analysis be expanded to consider in more detail 'what can be done', beyond recognizing that habitat bias is an issue? Would \*parallel\* multi-proxy and multi-species analyses be helpful for example (e.g. as a set of 'parallel equations' for habitat variability within a relatively constrained yet still unknown habitat range)?

I hope that you will find all of these comments helpful, and I look forward to receiving your revised manuscript and response.

Sincerely, Luke Skinner

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Interactive comment on Clim. Past Discuss., doi:10.5194/cp-2016-125, 2016.