

## ***Interactive comment on “Global analysis of seasonality in the shell flux of extant planktonic foraminifera” by L. Jonkers and M. Kučera***

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Reply to reviewer 1: We would like to thank the reviewer for her or his positive response to our paper. (In fact, it would be interesting to discuss the paper further and learn about the notes that did not make it into the review.) Below we have copied the reviewer's comments and provide a short response to each comment.

I have two minor remarks that, to me, do not require any other round of review: 1/ There is little information on how incorporating species known to thrive within the thermocline have been dealt with. *N. dutertrei*, for example, is within group A but known to thrive within the deep chlorophyll maximum (Fairbanks et al., 1980, Science; Fairbanks et al., 1982, Nature). In sediment traps from the Panama Basin, its maximum flux seems to occur in F-M-A-M while ruber flux maxima are occurring during J-J-A-S (Thunnel et al.,

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1983, EPSL). I feel there is perhaps some oversight WRT thermocline dwelling species in the article, especially given that both dutertrei and ruber, belonging to the same groups, have been reported to have maximal fluxes during late winter/early spring vs. summer, respectively, in the given example. Could the authors briefly comment on that, and/or add a small paragraph on that point?

This is a valuable point. However, it is important to note that species within a seasonality group do not necessarily have their peak flux at the same time. This is particularly true for species within group A (warm-water, symbiont bearing) where the peak flux occurs at a random time within their optimal temperature range. Moreover, it also seems that this optimal temperature range in *N. dutertrei* is somewhat wider than in *G. ruber* (SFig. 6). Specifically, the mean annual temperature at the Panama Basin site is  $>25^{\circ}\text{C}$  and thus well within the optimal temperature range for both species. Our model thus accounts for such differences in peak timing. Unfortunately the time series from the Panama Basin is of insufficient resolution (2 months) to yield meaningful results using periodic regression, which is why the time series was not included in the database. However, a rough estimate of the peak prominence (PP) values of *N. dutertrei* and *G. ruber* for this time series would be -1.6 and -0.9, respectively. These values are entirely consistent with our predictions for these species at this temperature, giving confidence to our model.

While we agree that it is important to understand what controls the peak timing (and peak amplitude) within the optimal temperature range of the species in group A, we would like to stress that the influence of seasonality on paleorecords in these cases is relatively small because of the low amplitude of the seasonal temperature cycle and the low flux variability (low PP).

2/ Even the large-size version of the figures are sometimes hard to visualize (e.g. figures 7 and 9). I suggest the authors to double-check that the published version of the figures will be readable once printed. In brief, I feel there is a strong baseline with this article to start tidying the interpretations of paleo-records published so far. I wish the

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authors good luck with this and hopefully other articles in the future.

We will make sure that all figures will be readable in the print version. The symbols in figure 7 will also be changed to improve clarity.

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Interactive comment on Biogeosciences Discuss., 12, 1327, 2015.

**BGD**

12, C684–C686, 2015

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