

## ***Interactive comment on “Calcification intensity in planktonic Foraminifera reflects ambient conditions irrespective of environmental stress” by M. F. G. Weinkauf et al.***

**Anonymous Referee #1**

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The Weinkauf et al. paper is well-written and produces an important data set. That being said, the paper requires some important revisions before it can be accepted for final publication. The authors need to address each of the following points.

1. In the Abstract, it is stated that Marshall et al. “could not exclude that ambient temperature played an important role in mediating” the observed relationship between shell area density and carbonate ion concentration. This is not correct. Rather, using multiple regression analyses, Marshall demonstrated that carbonate ion was the dominant variable controlling area density and that temperature (as well as phosphate) had no significant impact on area density. 2. Page 11216, Line 13 – define “optimal growth conditions”. 3. Van der Meer et al. (2007) is hardly the best reference for citing the C4261

planktonic foraminiferal oxygen isotope anomalies associated with sapropel formation. The paper by Williams et al., 1978, Science) is perhaps the first study to link decreases in foraminiferal  $\delta^{18}\text{O}$  with fresh water input during sapropel formation. 4. There is some confusion/misuse over the use of the term “measurement based weight” (MBW). Beer et al. present MBW data in units of  $\mu\text{g}$ , whereas Weinkauf use  $\mu\text{g}/\mu\text{m}^2$ . Clearly this latter unit is not a weight but rather is more similar to the area density measurement presented in Marshall et al. In fact, the equation used to determine MBF (equation 1) is not the equation given in Aldridge et al. for calculating MBF. 5. Page 11233, Line8: Barker and Elderfield did not study “modern foraminifera”. Their study was based entirely on fossil assemblages. 6. It would significantly improve the paper if  $\delta^{18}\text{O}$  data was included for *O. universa*, *G. inflata* and *G. scitula*. This would help identify depth habitat differences amongst the four species and show which species were being impacted by the low salinity water. 7. I am skeptical that the small number of individuals per sample (usually less than 10; in the case of *G. ruber* the median sample size is only 4 shells!) is adequate to determine the MBW. Why not take some randomly distributed samples and weigh each individual shell for these four species. This would allow you to calculate some standard deviations on your mean values.

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