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Interactive comment on “Pteropods from the Caribbean Sea: dissolution as an indicator of past ocean acidification” by D. Wall-Palmer et al.

D. Wall-Palmer et al.

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Thank you for taking the time and effort to review our manuscript and for making constructive comments. We feel that many of your comments are extremely useful and we will take them on board and make changes accordingly, however, we feel that some suggested changes are not necessary.

Firstly, only one sediment core is presented in this manuscript (CAR-MON 2). This misunderstanding must originate from the position of other cores on the site map (Figure 2), which therefore must be removed. A revised site map will be made.

1. The oxygen isotope record and age model for core CAR-MON 2 have been well documented elsewhere (Le Friant et al, 2008) and we therefore feel it is unnecessary

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to include this detailed information. We will ensure there is a clear reference to such documentation.

2. We feel that the important details from figure 4 have been discussed in adequate detail (page P6906). Dissolution patterns (caused by an increase in CO₂) would be reflected in aragonite shell production due to a decrease in the availability of carbonate. Since the life span of a pteropod is relatively short (varying but around 0.5 to 2 years) and changes in ocean pH occur over longer time periods, the effects seen would be that of poor shell growth – the production of a smaller, thinner shell and the inability to maintain the shell surface. We agree that this needs to be made clearer in the text.

3. From the extensive study of CAR-MON 2, we do not suspect any major past changes of water masses in this area. Firstly, if there had been changes in water masses, we would expect the oxygen isotope curve to be altered reflecting these changes. However, this is clearly not the case as the zonation of *Globorotalia menardii* proves the oxygen isotope results to be correct (see Le Friant et al., 2008). Secondly, we see no major shift in the assemblage of benthic foraminifera through the core. This suggests that bottom water conditions have been fairly constant through out the history of the core. We will make this clearer in the revised manuscript.

The effect of ash upon the dissolution signal has been discussed within the manuscript (P6907, lines 16-24). We agree that it is not made clear that ash produces a decrease in pH and this will be changed in the revised manuscript. Original ash chemistry is well documented elsewhere (Jones & Gislason, 2008) and we therefore feel it would be an unnecessary addition. We do not suspect there to be any dissolution caused by acidic pore waters, however, unfortunately, since the primary aim of the 'Caraval Cruise' was to investigate the tephrochronology and volcanic history of Montserrat, collection of pore water chemistry was not attempted. Pore water chemistry was collected during a further cruise to Montserrat (JC18) but not at the site of CAR-MON 2. Again, this was collected to investigate the role of recent volcanic ash and data was therefore only collected in the surface 5 cm of sediment.

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4. We feel that the comparison of our findings to other authors work in this field is well discussed (page P6905, line 16 to P6906, line 16).

5. We agree that the paper of Barker and Elderfield (2002) uses data from the North Atlantic. This is a typo and will be changed in the revised manuscript.

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