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**Biogeosciences Discussions**

# *Interactive comment on* "Impacts of exotic mangrove forests and mangrove deforestation on carbon remineralization and ecosystem functioning in marine sediments" *by* A. K. Sweetman et al.

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General comments

This is a useful paper, addressing an unusual topic for the mangrove literature ( a case where mangroves are exotic and invasive, and hence a potential problem, rather than the usual scenario where they are being removed and degraded). It is well structured and clearly written. Although the main findings (that mangrove sedimentary processes are predominantly driven by bacteria rather than macrofauna) are not surprising, the



use of isotopically labelled algae gives some nice data on rates of C assimilation in different habitats. Unfortunately the paper does not have replicate sites of exactly the same types; the authors are therefore appropriately careful in generalising their results (this represents a 'case study' of particular sites) but it seems reasonable to suppose that the key differences they find would apply to other similar sites in Hawaii and elsewhere.

Specific comments

p5 Study sites - Do you know why the control sites you chose remained free of mangroves? The reader is bound to wonder whether there were some a priori differences between forested and un-forested areas. So it would be useful to give a little clarification here - is most of the suitable shoreline now colonised, or is this a matter of mangroves still expanding in area and hence simply not yet reaching these sites?

p7 - incubations. Do you specify here that these are light or dark incubations?

p7 - chambers. You state you have n = 3 (4 chambers with one kept as a reference). But for many of your results (see Tables 2-4) sample size was 2. Can you explain this briefly in the results?

p11 - addition of labelled algae. line 263 states that 'rates ... have been normalised by the amount of algal-C added'. I think I can infer what you mean here from the preceding sentence but its not very clear (and quite an important point I think). Can you clarify this?

p13 -macrofaunal uptake rates. I found myself wondering here whether the big differences you report in Table 3 were simply a reflection of the differing total biomasses of the bacterial and macrofaunal components. But then I think you address this in Table 4 by giving proportional rates? (i.e. uptake of C per g of taxon?). Am I right here? This could be clarified in the text. If this is the right interpretation, then it would be interesting to know whether the rates of uptake, corrected for total biomass present,

differed significantly within key taxa (specifically oligochaeta) that were present in all the sites. That is, were the same taxa doing different things at the different sites? I think presenting formal statistical tests of these differences for all the taxa would be unnecessary, but interesting to see for the oligochaetes and capitellids. If, as Table 4 seems to suggest, there were significantly different rates of assimilation per unit mass for these taxa between different sites then that might imply interesting variability in their functional roles.

Technical corrections

p12 ln 302 - change 'densities' to 'abundance' p22 ln 570 - change Muxham to Huxham Table 1 - was Total C calculated as loss on ignition? Table 2 - 'unknown' category is the 2nd largest for PHM site . So useful to know if this was one or a few taxa, or represents a diverse group p36 ln 827 '.. cores from all Pearl Harbor sites are..' p36 ln 837 - please state whether total benthic biomass = bacteria and macrofauna

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