



EGUsphere, author comment AC2
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Reply on RC2

Jérôme Pinti et al.

Author comment on "Model estimates of metazoans' contributions to the biological carbon pump" by Jérôme Pinti et al., EGU sphere,
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Thank you very much for your comment and for taking the time to review our manuscript. Our answers to your three comments are as follow:

1/ Yes, it is theoretically possible to have several Nash equilibria in this case (depending on initial conditions). We investigated this with a number of different initial conditions, and did not find several equilibria in any of the set ups tested. We will add a comment about this to the section of the SI talking about Nash equilibria (section 1.5).

2/ While we agree that both studies are different, the comparison with Nowicki was provided because it is the only other study we know of that estimates the sequestration of carbon mediated by different pathways of the biological carbon pump on a global scale. We can still compare the relative importance of different pathways (eg fecal pellets vs. respiration) with Nowicki's study, as we do in the discussion.

3/ It is a bit hard to predict what will happen to carbon export and sequestration as a harvest rate does not linearly relates to a biomass decrease. However, you are right that our discussion was a bit thin on that topic. We can expend the discussion after l. 323 to talk about the difficulties of relating the harvest rate to carbon export and sequestration: "The exact form of this trade-off is hard to assess, as the rate of biomass harvest cannot be equated to the biomass inventory -- and thus to the export rate and inventory of sequestered DIC. Indeed, if the harvest can be done sustainably and without affecting the total biomass, then it is possible that it has relatively little impact on carbon sequestration".