

Interactive comment on “Carbon export and sequestration in the southern Benguela upwelling system: lower and upper estimates” by H. N. Waldron et al.

Anonymous Referee #2

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I have to agree with the comments of the other reviewer that this paper needs substantial revision before it can be published. The three methods described are very different, with different assumptions, so comparing them is difficult. It is particularly hard when, as seems to be the case, assumptions that relate to the northern Benguela are used to discuss the southern Benguela where conditions are different. Given that Swart's data have only previously been reported in a MS thesis, it is nice to see them here, even though they suggest only a small percentage of total production is exported via this route.

There is an obvious problem with terminology. New production refers typically to pro-

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duction resulting from the injection of nitrate into the euphotic zone from deep waters. As my colleague suggests, it does not generally refer to the recycling of nutrients within the coastal zone. So, from the point of view of a coastal area, one should perhaps refer not to "new production" in the sense used by Eppeley but to something like "potential nitrate-based production." This can then incorporate the nitrate-based production from both sources.

I share my colleague's reservations regarding the lack of incorporation of POC that is advected offshore into but does not sink out in the Waldron calculation. This could certainly be a significant portion of the total production. Also, there is considerable production from recycled nutrients, particularly at times when upwelling is not intense, that will complicate the calculations and does not appear to have been considered in either of the Waldron or Monteiro estimates.

Overall, I would like to see more discussion of the inherent errors in each method, as the present analysis and discussion is very simplistic. I cannot recommend the paper for publication in its present form.

Interactive comment on Ocean Sci. Discuss., 6, 1173, 2009.

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