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Interactive comment on “Impact of vertical and horizontal advection on nutrient distribution in the South East Pacific” by B. Barceló-Llull et al.

M. Hecht (Editor)

mhecht@lanl.gov

Received and published: 8 January 2016

Dear Dr. Barceló-Llull and co-authors, here are some comments that I pass on from Referee 1. Perhaps the opportunity to consider these comments now may facilitate the process of revision.

Wishing you the best of success. Sincerely yours,

–Matthew Hecht

Comments from Referee 1:

Having thought about the changes to be made to the manuscript my suggestion for minimal work would be: - rerun the particle code with releases at the same NO₃ isolevel

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that properly characterizes the nutricline - keep track of the vertical excursions of the particules during their integration (which may last longer than 30 days as advocated by the 2nd reviewer). Precisely the authors could keep track of: 1) the minimum depth reached during integration 2) some form of potential production index/ based on the theoretical amount of light received during integration. Using theoretical light penetration curves decaying with depth as exponential will allow the authors to quantify the history of vertical displacements of the particles with a weighting that is relevant to the evolution of NO₃.

This may save the implementation of "sink-source" terms that mimic those for NO₃ while still informing about what would happen to a NO₃-like tracer.

Obviously this diverts the story a bit and the comparison between the 2 integrations (with and without vertical advection) may have to be downplayed . On the other hand, I think much more would be learned by doing so.

Interactive comment on Ocean Sci. Discuss., 12, 2257, 2015.

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