

Interactive comment on “C, N and P stoichiometric mismatch between resources and consumers influence the dynamics of a marine microbial food web model and its response to atmospheric N and P inputs” by P. Pondaven et al.

Anonymous Referee #2

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Apparently very little thought went into the design and preforming of the model analysis and the writing of the ms. Obviously, a steady-state analysis of a closed system (chemostat) is the wrong approach to analysing mass-flux imbalances, such as net heterotrophy. Also, as outlined below, the ODEs do not add up to zero and hence do not maintain mass balance, and the results and conclusions do not appear to make sense. Thus, I do not recommend this ms for publication.

The most obvious problem is that the results are clearly non-sensical: in Figs. 3 and 5 differences between gross primary production (GPP) and net community respira-

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tion (NCR) are shown (and even interpreted) for results which were supposed to be close to steady state (asymptotic behaviour for t approaching infinity) in a closed system (chemostat). At steady state, GPP and NCR in a closed system are identical by definition.

The equations for gross growth efficiencies (GGE) on pp. 2940–2942 do not work out if consumer C:N and C:P are both greater than prey C:P and C:N, which is the case for the first row of Table 3, even for $a_{\max}=0.75$. Thus, the ODEs will not maintain mass balance.

If the authors calculated GPP from the second and third equation (they should have been numbered) in Table 1, this is wrong because it ignores DOC production. In this way one cannot use GPP and NCR to calculate net heterotrophy because DOC production by phytoplankton releases oxygen.

On p. 2949, the authors mention "postabsorptive excretion of DIP and DIN from consumers" but this is nowhere to be found in the equations.

Minor points: The reference Thingstad et al. (2007) is missing. constraints should read constraints and there are many more misspellings throughout the ms

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