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Biogeosciences Discussions

Interactive comment on "The significance of nitrogen regeneration for new production within a filament of the Mauritanian upwelling system" *by* D. R. Clark et al.

Anonymous Referee #2

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Review of ms # bg-2015-547: 'The significance of nitrogen regeneration for new production within a filament of the Mauritanian upwelling system' submitted by Clark et al to Biogeosci.

General comments

We have, surprisingly, only a very limited understanding of some of the basic nitrogen (N) cycle processes in the surface ocean. The new data on N assimilation and generation presented by Clark et al will help to improve our understanding of upper ocean N cycle processes in the upwelling region off NW Africa. The ms is (more or less) well written (see my points below) and the conclusions are justified by the presented data.

I recommend publication with minor revisions.

Specific comments

1) NH4+ regeneration: There might be NH4+ production by photochemical processes as well, see e.g., Rain-Franco et al. (2014). So, I am wondering whether NH4+ regeneration by photoproduction in the upwelling off Mauritania/NW Africa may play a role as well.

2) N deposition by aerosols may play a role for new production too; especially in view of the fact that filaments off NW Africa can receive a lot of Saharan dust input. Please discuss.

3) Nowald et al (2015) present particle flux (OM flux) data from a sediment trap deployed at the same time (and very close to the filament track) of the study described in the ms under review. I am wondering whether the OM flux data by Nowald et al may match those presented in Section 3.5.

4) There are rather old (but nevertheless important) studies on nutrient distribution and primary production off Mauritania/NW Africa by Minas et al. (1982a, b; 1986) which are ignored. Minas et al. calculated f ratio (0.9), N:Si ratios and measured PP rates. I suggest that these data are included in the discussion.

5)°In Zindler et al. (2010) N:P ratios and phytoplankton composition from the upwelling off Mauritania are presented. This ref. should be cited as well (see e.g., Sections 3.1 and 3.2).

6) p. 17800: I am not fully convinced by the discussion about particle associated nitrification. In a recent study by Ganesh et al (2014) it was shown that indeed denitrification is particle associated but not nitrification. So, I suggest that denitrification in sinking particles could take place in oxic subsurface water masses off NW Africa.

References

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