

## ***Interactive comment on “Bioavailable atmospheric phosphorous supply to the global ocean: a 3-D global modelling study” by Stelios Myriokefalitakis et al.***

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Received and published: 31 October 2016

Dear Editor,

We would like to thank the referees as well as Dr. Bikina Srinivas for their comments that helped improving the presentation of our study.

We have addressed all their concerns as it is detailed in the point-by-point replies to the referee's comments that we have posted in the open discussion session.

In particular, following the referee #1 comments, we have performed a new 11-year interannual global simulation 2000-2010 in 30x20 (lon x lat) horizontal resolution. All figures and results have been updated accordingly. The comparisons to observations

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are now not only day and location specific but also year specific as requested by the referee. As expected, no changes of importance were seen in the results and the model evaluation.

We have also performed again the sensitivity simulation using Wang et al (2014) anthropogenic emissions of P, following the referee' suggestion. Our conclusions remained unchanged. The presentation of our methodology has been improved for clarity and to avoid misunderstandings. We have also added section 2.3 in which we present the compilation of observations that are used for evaluation of our model results and which are detailed in the supplementary material Tables S1 and S2. In section 3.5 on solubility we have summarised available observations that provide hints on P solubility in the atmosphere and added a thorough discussion on the limitation when comparing these observations to our simulations (see details in our reply to referee #2 major comment 4).

Finally, the section 4.2 with the discussion on implications of our results for the biogeochemical cycles and on uncertainties as well as the conclusions have been further developed following both referee's comments.

We hope that our manuscript is now suitable for publication in Biogeoscience.

With kind regards,

The authors

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Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-215, 2016.

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