

Interactive comment on “The role of air-sea exchange in the marine nitrogen cycle” by T. Jickells

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In this article by T. Jickells atmospheric deposition and its effects on the marine environment are soundly reviewed. The major emission sources and reactions are characterized and their importance for the deposition into the ocean. Effects of this nitrogen sources for biological processes in coastal zones or the open ocean are presented. Here I like especially the estimate of the CO₂ drawdown potentially fostered by the new nitrogen (page 196). The clear statements in each chapter allow those readers - not very familiar with this topic - a relatively fast orientation and to remember the most important take home messages. Since many citations are included, one can easily find more in-depth information on specific aspects. Some critical remarks are: The chapter 2.3 on deposition misses the aspect of different precipitation types. There is a difference between advective (frontal) and convective deposition, which affects the amount of rain and its quantification strongly. This is not mentioned may be because it

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is a difficult issue even for specialists in the field. Then I was wondering what exactly is meant on page 188 (line 28) with the “element of model tuning to match existing data”. Furthermore, I do not quite agree with the authors’ statement on page 192 (line 8), that “the iron fluxes are little modified by human activity”. Factors like desertification and land use practices in arid regions are human induced and of growing concern. The dry sand can easily be moved by dust storms e.g. from the Sahel desert. In the Coastal Systems chapter, page 199, 2nd paragraph, a more detailed discussion of the temporal component deposition events have on the surface waters would be nice. I remember for papers by Spokes and Jickells, that the timing of the precipitation heavily influences the effect either inducing blooms or not. technical correction: The Voss et al. citation in the text has the year 2004, but it is 2005.

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