

Biogeosciences Discuss., referee comment RC2  
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## **Comment on bg-2022-107**

Anonymous Referee #2

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Referee comment on "Neodymium budget in the Mediterranean Sea: evaluating the role of atmospheric dusts using a high-resolution dynamical-biogeochemical model" by Mohamed Ayache et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-107-RC2>, 2022

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This paper is an extension of Ayache et al. (2016) which intend to simulate epsilon Nd and its concentration in the Mediterranean Sea, using a regional dynamical-biogeochemical coupled model. In this paper, authors have considered Nd sources from benthic sediments, river discharge and atmospheric input to assess their relative contribution in the Nd Cycle for the Mediterranean Sea. Based on the modelling exercise, they have concluded that Sediments are dominant (almost 90 %) contributor of Nd to its oceanic cycle, with minor contribution from dust deposition and river input. While Nd contribution from atmospheric dust is low (~ 5%), it is very sensitive to Nd cycle and potentially important parameter to investigate in other regions which are strongly impacted by dust deposition.

I have thoroughly enjoyed reading results and discussion of this well drafted paper. This paper is of utmost importance for both atmospheric and Oceanic community and fits well within the scope of Biogeosciences. There are few typos in the draft, which I believe, will be taken care during proof reading stage. I recommend this paper for publication.

Minor comments:

Line 63: can be reworded

Line 98: "...too-radiogenic..." not clear

Line 138: C:N:P ratio is 122:16:1.. is it correct"?

Line 141-143: Does smaller particle include Aeolian dust? It will be particularly important for open oceanic region as there is an enrichment of fine (clay) fraction in atmospheric deposition.

Line 185: Typo "the"

Reply