

Biogeosciences Discuss., referee comment RC2
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Comment on bg-2022-14

Gwenaël Abril (Referee)

Referee comment on "Assessing the spatial and temporal variability of methylmercury biogeochemistry and bioaccumulation in the Mediterranean Sea with a coupled 3D model" by Ginevra Rosati et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-14-RC2>, 2022

Dear Authors

please consider the following comments by an anonymous referee.

Best Regard

G Abril, associate editor

Anonymous review

The paper describe a modelling study of Hg cycle in the Mediterranean Sea using a high resolution regional model. It is a very interesting and important modelling effort since It is the first attempt to simulate this contaminant in this region with a coupled dynamical-biogeochemical model. The paper is well written and results are globally well illustrated and discussed. The modelling approach considers the main Hg species in the ocean and the related processes that control their exchanges and redistributions. The analysis focuses on MeHg species that represent the toxic species for ecosystems, and investigates

the transfer and bioaccumulation in the low trophic level, the planktonic reservoir (phytoplankton and zooplankton). It provides very new interesting and quantified informations on the spatial and temporal distribution of MeHg species in the different regions of the Mediterranean Sea. I then recommend this paper for publication, but suggest also some major revision on the description of the model. The paper focuses mainly on MeHg species, but the cycling of Hg in the Mediterranean sea is controlled by the distribution and exchange among all the different species that are not well document in this paper, while it is of importance to assess the consistency of the results.

Recently an assessment of Mercury in the Mediterranean Sea has been published (Cossa et al, 2022). It provides constraints on sources of hg in the Mediterranean Sea (atmospheric, riverine, sediments) , exchange fluxes at Gibraltar with the Atlantic Ocean, and budget of THg and MeHg in the western and Eastern basin. I suggest that before publication, , this paper compares in its supplementary material, its modelling results with the budget derived by this Mediterranean Hg assessments, in order to verify that the global modelling approach is coherent with observations.

Cossa et al. Mediterranean Mercury Assessment 2022: An Updated Budget, Health Consequences, and Research Perspectives. Environ. Sci. Technol. 2022, 56, 3840–3862