



## **Interannual variability of the biogeochemical fluxes in the deep water formation area in the northwestern Mediterranean Sea from a 3D coupled physical-biogeochemical model**

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A biogeochemical model was coupled to a regional circulation model to investigate the interannual variability of the biogeochemical fluxes in the northwestern Mediterranean Sea. The physical model is the primitive equation ocean circulation S model [Marsaleix et al., 2011]. The biogeochemical model Eco3M-S [Auger et al., 2011] was used to describe the cycles of carbon, nitrogen, phosphorus and silica.

The model results were compared with a set of in-situ and satellite observations available over the 5-year period study, 2004-2008. The comparisons provided a reasonable validation of the model reproducing the recorded spatial and temporal variations and suggested that it can be used to estimate a budget of biogenic elements.

A strong variability of the intensity of the deep convection was observed over the study period. We investigated the impact of this variability on (1) the import of nutrients upwelled in the surface layer, (2) the primary production, (3) the export of organic carbon towards the bottom and on (4) the lateral exchanges.