



Modeling study of the influence of mixing on the fluxes of nutrients through the water column redox-interfaces

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In this study we used a coupled hydrophysical-biogeochemical O-N-S-P-Mn-Fe- model based on ROLM (Yakushev et al., 2007) and GOTM (Burchard et al., 2006). Processes of organic matter (OM) formation and decay, the reduction and oxidation of species of nitrogen, sulphur, manganese, iron, as well as transformation of phosphorus species are parameterized. The model considered phytoplankton, zooplankton and bacteria. The model allowed to simulate the main features of the vertically balanced biogeochemical structure of the redox interfaces (i.e observed in the Black Sea, Gotland Deep, Oslo Fjord). Numerical experiments allowed to demonstrate how the changes in vertical mixing (from $K_z=10^{-6} \text{ m}^2\text{s}^{-1}$ to $K_z=10^{-4} \text{ m}^2\text{s}^{-1}$) affect the distributions of the considered parameters and the rates of their transformation. The received estimates allowed to analyze the influence of the water column redox interfaces on the fluxes of nutrients, in particular phosphate, in different conditions.

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