



Future ocean biogeochemical cycles sensitivity and robustness with an Earth system model

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In order to address the sensitivity of the potential feedbacks between climate and ocean biogeochemistry we use a global model of the Earth system (LOVECLIM). The standard version of the model predicts that over the next centuries the main change in the biogeochemical oceanic cycle is the significant decrease in silicate content in the euphotic layer at high latitudes. Silicate concentrations in the Southern Ocean drop by as much as 30% in 2300 under scenario A2 when compared to the control run. This model, as most ocean biogeochemical models of application for the study of future global changes, relies on simple parameterizations and on basic biological formulations. This puts serious limitations on any predictive capacity at long timescales. However such models offer the possibility to perform many experiments at a time and so to evidence the most significant processes. In a series of sensitivity studies spanning several centuries we examine the robustness of the predicted changes with respect to different biological parameterizations and formulations.