

## A modeling study of early diagenesis using an ocean sediment model

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In the ocean upper sediments, the concentration of dissolved materials in pore water changes due to the decomposition or dissolution of biogenic solid particles that have settled down the water column. Because the condition of ocean sediments affects the long-term global ocean biogeochemical cycle through the interaction of dissolved materials at the sediment-water interface, it is necessary to properly simulate the early diagenesis. It is confirmed that the sediment model, which is created based on the formulation presented in previous studies, reproduces the burial and the distribution of biogenic solid particles by giving boundary conditions based on observational data at the sediment-water interface (the sedimentation flux of solid particles and the concentration of dissolved materials) and appropriate parameter settings. We quantitatively evaluate the impacts of the sedimentation flux of biogenic solid particles reaching the seafloor, dust deposition, the coefficient of dissolution rate, and the concentration of dissolved materials above the seafloor on the distribution of solid particles.

Keywords: ocean sediment model, ocean biogeochemical cycle, early diagenesis