続成過程モデルによる沿岸域の堆積物中における物質循環

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Abstract

Nutrients and Hydrogen sulfide fluxes from a benthic sediment becomes important causes on water pollution in a coastal environment. To understand the mechanism how these benthic fluxes are controlled, we performed a numerical experiment by using the CANDI model that can simulate the diagenetic processes in the sediment. The model results showed that an organic matter provided to a sediment from water column is decomposed by bacteria which uses O_2, NO_3, MnO_2, $Fe(OH)_3$, and SO_4 as a substrate. Especially the fraction of decomposition process using SO_4 as a substrate occupied 70% of all processes, which suggested an anaerobic environment in the sediment. The main factor that determines whether an environment in the sediment is aerobic or anaerobic is a sinking flux of an organic matter from water column. To keep an aerobic environment in the sediment, it is necessary to reduce the sinking flux of organic particulate matter.