

有明海の泥質干潟・浅海域での窒素循環の定量化

—泥質干潟域の浮遊系—底生系結合生態系モデルの開発—

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Abstract

A pelagic-benthic coupled ecosystem model has been developed for a tidal mud flat and shallow-water area of Ariake Bay, reflecting key features of the area, e.g., development of anoxic conditions in the sediment, composition of the benthic biomass, deposition and resuspension of sediments, and their influences on the nitrogen cycle. The nitrogen cycle and budget were estimated through simulation run for a year. Water purification capability, defined by the removal of nitrogen from the system, was estimated at $7.2 \text{ mgN m}^{-2} \text{ day}^{-1}$. Denitrification corresponds to 97% of the total removal flux of nitrogen from the system. High primary production rates exceeding the total transformation rate from organic nitrogen to inorganic nitrogen shows that this mud flat and shallow-water system is an autotrophic system. Except for artificially intervened bivalves grounds, bivalves in the muddy flat and shallow-water area have only a limited role concerning the control over the blooming of phytoplankton.