

2015年12月25日受付, 2016年3月7日採録

## **Abstract**

A refined numerical model to precisely simulate the biological and physical cycle in muddy tidal flat was developed by improving an existing model constructed for the tidal flat extending on the Shiota river mouth (Shiota tidal flat) in Ariake Sea in past years. For the newly developed model, the relationships of water quality including suspended solids to tidal change was formulated based on in situ data, and calibrated with observation results in multiple years to universalise it. The model could simulate well the concentrations of  $\text{NH}_4\text{-N}$ ,  $\text{NO}_x\text{-N}$  and suspended solids in sea water, which were strongly associated with denitrification, compared with the existing model. The nitrogen transportation in the Shiota tidal flat calculated with this model clarified that the generation of organic nitrogen on the tidal flat was especially significant, and the tidal flat was considered to be a source of organic matter for Ariake Sea.