

## Responses of lower-trophic level ecosystem to nutrient variation in the central part of the Seto Inland Sea

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The Seto Inland Sea is a representative coastal sea in Japan, and various environmental problems such as harmful algae bloom and hypoxia associated with the eutrophication have occurred during 50 years. The nutrient supplies from the terrestrial region related to the human activity have been reduced through the efforts for environmental cleanup over the last several decades. As a result of such excessive environmental cleanup, oligotrophic condition frequently occurred in this region in recent years. The relationships among oligotrophication, primary productivity, and fishery resources such as anchovy in this region are not clear. In this study, we investigated the responses of the lower-trophic level ecosystem in the central Seto Inland Sea to the nutrient variations using a plankton functional types model eNEMURO (4N-4P-4Z-3D). We used two different nutrient conditions for the model based on the time series observations, one was in 2005 with the good catch of anchovy larvae, and another was in 2011 with the poor catch of them. The model results showed that the spring diatom bloom in 2011 was much lower than those in 2005 due to the low nutrient concentrations in the spring of 2011. The meso-zooplankton biomass in the spring of 2011 was also lower than those in 2005 associated with the reduced spring diatom bloom in 2011. We summarized that the interannual variation of nutrient concentrations in the spring may control the interannual variation of anchovy stocks by regulating the scale of the spring diatom bloom in this region.

Keywords: ecosystem model, nutrient, diatom, meso-zooplankton, anchovy