

# Numerical analysis of the ecosystem responses to the changes of nutrient supply in the Western Seto Inland Sea, Japan

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The Seto Inland Sea is a representative coastal sea in Japan, and the nutrients in this region are mainly contributed by the following three nutrient sources; river, sediment, and open ocean. The nutrient supplies from the river and sediment 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. On the other hand, the nutrient supply from the open ocean associated with the oceanic water intrusions is rich in its variations because the oceanic water intrusions are closely associated with the current speed and position of Kuroshio Current south of Japan. In this study, we investigated the responses of the lower-trophic level ecosystem in the Western Seto Inland Sea to the variations of the above three nutrient supply amounts using an ecosystem model. Sensitivity analysis showed that the nutrient supply amount from the open ocean has much larger impact on the ecosystem than the nutrient supply amounts from the river and sediment. Large phytoplankton (diatom) and mesozooplankton (copepod) are dominant in the plankton assemblage in this region and they are highly sensitive to the variations of the nutrient supply amount.

Keywords: ecosystem model, nutrient, oceanic water intrusion, oligotrophic condition