

## A benthic-pelagic coupled ecosystem model to clarify nutrient cycles in coastal areas

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In many enclosed coastal seas in Japan, coastal environment have changed due to increase of nutrient loading and land development after 1960s. This caused loss of material cycles balance, generation of red tides, anoxic conditions and hydrogen sulfide. Water quality has been gradually improved because of some policies such as water quality standard and water pollution control law, but the loss of balance remains in many areas. It is because various factor such as benthic system, fishery industry and the open sea of the areas affect it.

We developed a benthic-pelagic coupled ecosystem model to clarify the role and the contribution of them. The model also included important factors for the coastal environment as dissolved oxygen, oyster and eelgrass.

It was developed for Mitsu Bay area in the western part of Seto Inland Sea. In this area, oyster culture distribute widely. Model results indicated the most important factor for the material cycles was advection from out of the area. Nutrient load had lower impact than advection and oyster. Anoxic water did not appear but the oyster culture caused accumulation of organic matter on the sediment under oyster rafts and hydrogen sulfide production. It was suggested that control of it is important for improve the material circulation and keep it in balance.

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