

2007年11月6日受付 2008年2月22日採録

Abstract

The formation of oxygen water depleted mass during summer is a main environmental issue of the Mikawa Bay. Sinking fluxes of plankton and detritus greatly influence on the generation process of oxygen depleted water mass. Because the sinking organic matter is decomposed by bacteria using oxygen. The terrestrial loading of nutrients and organic substance had increased in Mikawa Bay until about 1980, and also intensive reclamations were carried out in shallow sea area of Mikawa Bay in 1970's. Therefore we have thought that the formation of the oxygen depleted water mass in Mikawa Bay could be related to an increase of the loading and the land reclamation. In this study, we attempt to determine which is the main process to form the oxygen depleted water mass, by using a numerical ecosystem model. The model run covered from 1961 to 1990. The model results show increased sinking flux of particulate organic matter that related to the oxygen consumption in the sediment in the first half of 1970's compared to early 1960's. It exceeded 500mgC/m²/day in the latter half of 70's, and this level was maintained afterwards, even though the nutrient loading from terrestrial origin decreases in the latter half of 80's. The reclamation of Mikawa ports starts in 70's, and then the amount of the resource the shellfish decreased. The model results show the negative correlation between the shellfish resource and total area of oxygen depleted water mass exists. Therefore, we can conclude that a decrease of the shellfish due to the reclamation greatly influenced on formation of the oxygen depleted water mass.