宍道湖・中海における植物プランクトン優占群落の季節変動と遷移の解析

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Abstract

In order to investigate the possibility of seasonal succession between a grazing food web and a microbe food web, and the seasonal variation of the dominant species of phytoplankton, an ecosystem model is developed. The prey-predator interactions and the interspecies competition are incorporated into this new model. This improved model is applied to analysis of the Lakes Shinji and Nakaumi ecosystem for 1998.

In the model results of physical processes, the tendency of water mass change and the density gradient between the upper layer and bottom layer are reproduced well. The simulated results of the biological processes using the ecological model show good agreement with field data. Especially the release of PO4-P from the bottom sediment and the formation of oxygen-depleted water in bottom layer of Nakaumi in summer are reproduced well. Sensitivity analysis suggests that the filtration rate of shellfish and the horizontal diffusivity play important role on phytoplankton blooming in winter. The model also suggests the possibility of the succession of the dominant plankton species.