INFLUENCES FROM THE OCEAN MAINTAINING THE AQUACULTURAL ENVIRONMENT IN UWA SEA, JAPAN

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Marine pollution caused by aquaculture is one of the serious problems of marine environment in the world. Uwa Sea, which is the east part of Bungo Channel located between Pacific Ocean and Seto Inland Sea, is one of the greatest grounds of fish culture and pearl oyster culture in Japan. Although the activity of aquaculture is so high, the marine environment is not so polluted. In this area, two types of intrusion from the open ocean have a strong effect on the coastal environment, especially in the summer period. One is a *Kyucho* (Takeoka *et al*, 1992), which is the intrusion of warm and nutrient depleted water into the surface layer. The other one is a bottom intrusion (Kaneda *et al*, 2002), which is the intrusion of cold and nutrient rich water into the bottom layer. It is expected that these intrusions play a role to keep the comfortable environment for aqua culture in Uwa Sea. In this study, we tried to confirm this hypothesis with a box model for the nitrogen budget.

Field surveys were performed at Kitanada Bay which is located at the central part of Uwa Sea in the summer of 2001. During the measurement period, both types of intrusions occurred. The results of the surveys show that; 1) these intrusions enhanced the water exchange of this bay, 2) when the Kyucho occurred, large amount of particulate organic nitrogen and ammonium were flushed out through the lower layer of the bay, 3) when the bottom intrusion occurred, nitrate and nitrite from outer ocean flowed into the bay, and these nutrient supply enhanced the concentration of Chla in a few days. The maximum influx of nitrate and nitrite induced by the bottom intrusion is 3.8 ton/day, which is 20 times larger than the flux of river flowing into this bay.