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# サンゴ礁における炭酸系動態モデルによる$CO_2$吸収量評価

# Evaluation of $CO_2$sink/source potential in a coral reef using carbonate system dynamics model

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We have developed carbonate chemistry dynamics model incorporating major processes in a coral reef (Shiraho reef, Okinawa). The model is based on a physical model which can describe hydrodynamic features in shallow (~2m in average) reef areas (~10km$^2$) such as current field, sediment transport and heat budget. P-I curves for photosynthesis and calcification obtained from literatures were given to benthic communities such as corals or seagrasses, and carbon dynamics were simulated in Shiraho reef. Spatial distribution of $CO_2$sink/source potential was also assessed from the simulation. The simulation of DIC and total alkalinity variations matched reasonably well with diel cycle of these parameters obtained in the field, indicating photosynthesis and calcification are the major processes working in this reef. The model showed large spatial differences in $CO_2$ sink/source potentials, which suggests that the data obtained from a single point observation sometimes obscure the result and thus should be taken with care.

Keywords: Carbonate chemistry, Coral reef