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## A simulation model for coral reef formation: growth patterns responding to relative sea-level histories

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Coral reef topographies and reef growth patterns are influenced from relative sea-level histories. Several types of reef growth patterns responding to the relative sea-level histories, e.g. balanced aggrading/onlapping, seaward prograding, back stepping, etc., have been identified in previous studies. Recently, Nakamura and Nakamori (Coral Reefs 2007, 26, 741-755) developed a geochemical model for coral reef formation based on diffusion-limited and light-enhanced calcification, and the model reconstructed well the reef topography and Holocene reef-growth history. In this presentation, the model is modified, and simulated it on four scenarios of relative sea-level histories. The simulation result on the first scenario, which is similar with global sea level history between 8,000 years B.P. and present, is very similar with balanced aggrading/onlapping type of Holocene fringing reefs. The simulations on the scenarios of stable sea level and gradual sea level falling are well-reconstructed seaward prograding type reefs. The result of the simulation on the scenario of faster sea-level rising is similar with back-stepping type reefs. Therefore, the reef topographies and growth pattern responding to relative sea level histories simulated by the model were in general well-reconstructed concerning Holocene reefs observed in nature.