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## A Study on the Numerical Evaluation Method for CO<sub>2</sub> Absorption by Marine Ecosystem

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**Summary:** Technologies enhancing primary production are expected to promote CO<sub>2</sub> absorption by marine ecosystem. When we evaluate the effectiveness of these technologies, ecosystem models are valuable tools for evaluating the amount of CO<sub>2</sub> absorption. To evaluate the amount of CO<sub>2</sub> absorption by marine ecosystem, we made an ecosystem model, which has detailed decomposition process of particulate organic matter. In addition, the model can simulate both carbon cycle and nitrogen cycle, to consider the CO<sub>2</sub> flux between atmosphere and ocean. As a result, the model suggested that detailed biodegradation process improves the accuracy. Then we embedded the ecosystem in the three-dimensional physical model and tested the effectiveness of the coupled mode by comparing the simulation with observation of the coastal sea area of Nagasaki. Finally, we suggested that the carbon budget between atmosphere and ocean would fluctuate with the variation of the vertical profile of C/N ratio.

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