

## Effects of tides on the response mechanisms of marine ecosystems to river water

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The role of tidal currents and river-origin nutrients on the mechanism of phytoplankton growth in Akkeshi Bay, Hokkaido, was examined using a numerical model. Akkeshi Bay is a brackish water area that is located between the Pacific Ocean and Lake Akkeshi, and Bakanbeushi River water is known to flow into this bay. The flow field is strongly modulated by tides but it is not clear how it affects the ecosystem of Akkeshi Bay. In this study, a non-hydrostatic model was used to understand the role of mixing between river water flow and seawater on the growth of phytoplankton. We initialized the model based on observed data and forced the model with tidal currents at the mouth of the river and offshore. To evaluate the role of tidal currents, we also ran an experiment with a steady flow. Model results showed thin inflowing river water that is spreading over the seawater and expanding offshore. More phytoplankton growth occurred when tidal currents exist. In the future, we plan to identify the mechanism of mixing and discuss the cause behind the growth of phytoplankton.

Keywords: phytoplankton, brackish water, tidal current, mechanism of mixing