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Chemical Fluxes in a Subtidal Benthic Community of the Marian Cove, King George Island, Antarctica

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ABSTRACT. Benthic exchange rates of oxygen, ammonium, nitrate, phosphate, and silicate in a subtidal benthic community of the Marian Cove, King George Island, Antarctica were determined in 95/96 and 96/97 austral summers. Direct measurement of the inorganic nutrient fluxes out of a subtidal benthic community was attempted by deploying a set of benthic flux chambers on the bottom at about 30 m below the surface of the cove. High benthic respiration (23 to 40 mmol m^{-2} d^{-1}) and high ammonium flux (0.4 to 4 mmol m^{-2} d^{-1}) were observed despite low particle flux into the benthic community. On the other hand, phosphate flux (<200 μmol m^{-2} d^{-1}) and silicate flux (<1000 μmol m^{-2} d^{-1}) were not high, and on the contrary, nitrate was decreasing with time. High benthic respiration despite low organic input to the benthic community reflects that there must be the other organic source in the community, and the ammonium released from the benthic community might be mostly recycled in the benthic community because benthic ammonium flux was far exceeding primary productivity in the surface water. Evident high productivity of benthic microalgae measured in lab suggests that benthic microalgae might be the source of excess organic production in the subtidal benthic community and consequently, responsible for high benthic respiration.

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