

Automatic measurement of gas emission/uptake of Alaskan permafrost soils

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The release of carbon from the decomposition of organic matters in permafrost soils are very important for the acceleration of global warming. We applied our dynamic system to Alaskan soils and measured temperature dependence of gas (CO₂, CH₄, N₂O, NO, H₂, CO) emission/uptake. The Four core samples were placed on petri-dishes which were put into chambers where temperature was controlled. CO₂ emission from soils showed variations different from sample to sample. Even at -5C, CO₂ emissions were observed. From the time series of CO₂ emission rates, we estimated Q₁₀ values. Q₁₀ values were similar between 5-15C and 15 and 25C. Some soils also temperature-dependently emit NO, CO and N₂O.

Keywords: permafrost soil, Alaska, CO₂, NO, laboratory experiment