

ACG031-09

Room: 301B

Time: May 28 11:11-11:24

Radiocarbon-based estimates of residence times for soil organic carbon of Tundras and Boreal forests in Alaska.

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High-latitude soil organic carbon (SOC) stocks are of particular interest because warming is expected to be greatest and induce acceleration of SOC decomposition at high latitudes, raising questions about the fate of SOC. However, merely knowing the size of the reservoir of carbon stored soils is insufficient for predicting its potential to influence atmospheric CO₂ concentrations. We must also know something about soil carbon dynamics in high-latitudes.

Our objects in present study are to obtain the data of residence times and rate of CO₂ production from heterotrophic respiration of SOC. We conducted soil, soil CO₂ and soil respired CO₂ sampling in 2 Tundras, 3 Boreal forests and 1 Tundra-boreal forest ecotone along Dalton highway in Alaska in September 2009 and measured these ¹⁴C. ¹⁴C values of SOC suggested that boreal soils had large amount of SOC above permafrost because of high accumulation rates. We also estimate residence times and rate of CO₂ production from heterotrophic respiration of SOC. We inform about these results and examine substrate of soil CO₂ using ¹⁴C in this conference.

Keywords: Soil organic carbon, Radiocarbon, Residence time, Arctic region