

## Radiocarbon based carbon source identification of soil respiration, Spitsbergen Island in the Norwegian high Arctic

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Spitsbergen Island in the Norwegian high Arctic, raised beach deposits are widespread on the northwestern coast. Recent works report fragile characteristics in the soil organic carbon reservoir under near future global warming as novel source of carbon dioxide source. High latitude region including the Arctic has largest reservoir of soil organic carbon in the Earth. Since the high latitude region would be significantly influenced with environmental change under global warming, fragile of soil carbon reservoir should be investigated. Thus we investigated here the carbon source of soil respiration to evaluate fragile characteristics of the soil organic carbon using radiocarbon as a novel sensor of increased soil respiration under future global warming. Here we used radiocarbon to source-apportionment two carbon sources from modern plant and ancient carbon which accumulated in the geological time scale. The study site is situated in Ny-Ålesund, Spitsbergen Island. The deposit layer was observed 20-30 cm depth from the mineral soil surface in the study site. Soils of the deposit layer (20-22 cm) and other soil layers (0-2 and 10-12 cm) were collected for radiocarbon measurement of bulk organic matter and microbial lipids in situ living in the soil. In addition, CO<sub>2</sub> from the soil and soil surface were collected using vacuum tight glass bottle for radiocarbon content measurement. In the conference, the radiocarbon based carbon source apportionment of soil respiration will be discussed in the light of isotopic mass balance approach as a novel sensor of fragile soil carbon reservoir in the Arctic.