Oral | Symbol A (Atmospheric, Ocean, and Environmental Sciences) | A-CG Complex & General

[A-CG36_30PM1]Science in the Arctic Region

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The Arctic region and surrounding circumpolar region is the key area for the study of global change because the anthropogenic impact is projected to be the largest in this area due to the complicated feedback processes of the nature. A number of international and interdisciplinary research projects are in progress for the studies on the atmosphere-ocean-land system under the extension program of the International Polar Year (IPY) during 2007 to 2008. In order to understand the feedback processes occurring in the Arctic and to project the global warming in the future, we need to establish the intense observational network and to exchange the knowledge and information by combining the different scientific communities under the common interest of the Arctic. Contributions from Green Network of Excellence (GRENE) Arctic Climate Change Research Project are also welcome.

2:15 PM - 2:30 PM

[ACG36-P07_PG]Mineralization Rate of Soil Organic Carbon at the Lowland of Indigirka River in Northeastern Siberia

3-min talk in an oral session

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The Arctic has a large amount of organic carbon accumulated in the soil. If the enhanced warming under the Anctic amplification leads to higher soil temperature or deepening of the active layer, emission of greenhouse gases, i.e. CO_2 and CH_4 can increase. The decomposition rate of organic matter, which is an important factor of CO_2 and CH_4 emission, depends not only on the quantity of organic matter, but also on that quality. In this work, surface soils from the lowland of Indigirka river in Northeastern Siberia were incubated at constant temperatures (5, 10 ℃) to evaluate the production rates of CH_4 and CO_2 and to know the degradability of the soil organic matter. The study site is around Chokurdakh (70.62 N, 147.90 E) located in the continuous permafrost of Eastern Siberia and situated in the boundary of tundra and taiga. Surface soil layers (ca. 10-60 cm deep) were sampled at 7 points of a drier mound with larch trees and of wetter areas with sedges and *Sphagnum spp.*. Besides thawed layers (10, 20, 30 cm deep) sampled in July were incubated at Chokurdakh for 8 days anaerobically, frozen soil layers sampled in the early summer of June (13-62 cm) were incubated in Japan for 34-42 days both anaerobically and aerobically. These soils include the active layer (ca. 20-50 cm) and the top of the permafrost of this region.CH_4 production was not detected in the mound soils while CO_2 production was, suggesting areas with dry condition have few methanogens and will not produce CH_4 even if they turn into anaerobic condition. On the other hand, soils from wet areas produced CH_4 (0-0.88 μ mol (g dry soil)$^{-1}$ day^{-1}) and the

production as well as that of CO_2 was more active at the shallower layers, representing larger amount of labile organic matter. The rate of CH_4 production at 10 ℃ were found to be 0.9-1.1 times of that at 5 ℃ in the shallower layers (ca. 10-40 cm), while 1.9-3.3 times in the deeper layers (32-45 cm). It indicates that the temperature dependency of CH_4 production is higher in the middle to the bottom of the active layer than in the top layer.