

Change in Terrestrial Ecosystem of Pan-Arctic and effect on Climate

SUGIMOTO, Atsuko^{1*}, ISHIKAWA, Mamoru¹, KODAMA, Yuji², Masafumi Sasaki³, YAMAZAKI, Takeshi⁴, MATSUURA, Yojiro⁵, UCHIDA, Masaki², Rikie Suzuki⁶, IIJIMA, Yoshihiro⁶, SAITO, Kazuyuki⁶, PARK, Hotaek⁶, OHTA, Takeshi⁷, HIYAMA, Tetsuya⁸, Akira Osawa⁹, Takeshi Ise¹⁰

¹Environmental Earth Sci Hokkaido Univ, ²National Institute of Polar Research, ³Kitami Institute of Technology, ⁴Faculty of Sci Tohoku Univ, ⁵Forestry and Forest Products Research Institute, ⁶JAPAN Agency for marine-earth science and technology, ⁷Bioagricultural Sci Nagoya Univ, ⁸Research Institute for Humanity and Nature, ⁹Faculty of Agriculture Kyoto Univ, ¹⁰Graduate School of Simulation Studies University of Hyogo

Terrestrial ecosystem of Pan-Arctic is an important part of Arctic climate system, which interacts with atmosphere and ocean and greatly affects global climate through a change in surface albedo, emission of green house gases, and so on. Those changes are expected to be caused by the interaction among vegetation, hydrology, and material cycling. Another important aspect of the Pan Arctic terrestrial ecosystem is distributions of permafrost and vegetation, which are very different condition spatially, therefore, a spatially different response to a warming environment is also expected.

Green Network of Excellence (GRENE) Arctic climate program by MEXT has initiated in 2011, and GRENE-TEA (GRENE Terrestrial Arctic Ecosystem) project has started in this program. Observation and research plans of GRENE-TEA project are introduced in our presentation.

Interdisciplinary observations, including permafrost hydrology, ecology, biogeochemistry, meteorology, climatology, dendrochronology, etc. are planned in Svalbard, Finland, eastern Siberia, Alaska, and Canada, to investigate the system. Systematic observation network is also established: long term observations at supersites, observation with mobile system to know a spatial variation near the supersites, and simple system for soil temperature measurements for numbers of sites are planned to obtain systematic dataset, which will promote joint research between observation and modeling works. Cooperation between observation and modeling works is one of the important challenges in the program.

Keywords: Arctic, ecosystem, permafrost, vegetation change, methane