A06-O11

MEMORY EFFECTS FOR EXISTENCE OF SURFACE PERMAFROST IN EASTERN SIBERIA UNDER WARMING TREND

Hisashi Sato *(Japan Agency for Marine-Earth science and Technology (JAMSTEC), Japan)*
Go Iwahana *(International Arctic Research Center, University of Alaska Fairbanks, USA)*
Takeshi Ohta *(Graduate School of Bioagricultural Sciences, Nagoya University, Japan)*

hsato@jamstec.go.jp

The larch forest in eastern Siberia is the world's largest coniferous forest. Existence of this forest is dependent on near-surface permafrost, which enhances the availability of water for trees, and the larch forest in eastern Siberia strongly coincides with the continuous and discontinuous permafrost zone. A forecasted warming trend during the 21st century is expected to degrade near-surface permafrost across Siberia, although forecasts for the fate of Siberian larch forest under the warming trend vary greatly among studies, making this region one of the largest sources of uncertainty for the prediction of land-atmospheric interactions. Our projections indicate that degradation of near-surface permafrost and larch forest under a warming trend would be delayed by a "memory effect" of aboveground structures in larch forests, including the thick surface organic layer that covers larch forest floors in eastern Siberia and inhibits atmosphere-soil heat exchange. Our study is the first to consider such aboveground structures' function in buffering eastern Siberian larch forests against severe degradation under a warming trend. Our findings suggest that forecasted global warming would degrade the Siberian larch ecosystem, but this response could be delayed until occurrence of stand-replacing fire, which diminishes such aboveground structures.