



Explaining the dependence of climatic response of tree radial growth on permafrost

Marina Bryukhanova (1), Anna Benkova (1), Georg von Arx (2), Patrick Fonti (2), Valentina Simanko (1), Alexander Kirilyanov (1), and Alexander Shashkin (1)

(1) V.N. Sukachev Institute of Forest SB RAS, Krasnoyarsk, Russia, (2) Swiss Federal Research Institute WSL, Birmensdorf, Switzerland

In northern regions of Siberia it is infrequent to have long-term observations of the variability of soil features, phenological data, duration of the growing season, which can be used to infer the influence of the environment on tree growth and productivity. The best way to understand tree-growth and tree responses to environmental changes is to make use of mechanistic models, allowing to combine already available experiment/field data with other parameters based on biological principles of tree growth.

The goal of our study is to estimate which tree species (deciduous, conifer deciduous or conifer evergreen) is more plastic under possible climate changes in permafrost zone. The studied object is located in the northern part of central Siberia, Russia (64°N, 100°E). The study plot was selected within a post-fire succession and representatives for 100 years old even aged mixed forest of *Larix gmelinii* (Rupr.) Rupr. and *Betula pubescens* Ehrh. with few exemplars of Spruce (*Picea obovata* Ledeb.).

To understand physiological response of larch, birch and spruce trees to climatic changes the ecological-physiological process-based model of tree photosynthesis (Benkova and Shashkin 2003) was applied. Multiparametric tree-ring chronologies were analyzed and correlated with climatic parameters over the last 77 years.

This work is supported by the Ministry of Education and Science of the Russian Federation (Grant from the President of RF for Young Scientists MK-1589.2014.4).