

EGU21-9278

<https://doi.org/10.5194/egusphere-egu21-9278>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Intra-annual climatic signal in tree rings of *Larix* sp. based on the Vaganov-Shashkin model output

Marina Fonti¹, Olga Churakova (Sidorova)¹, and Ivan Tychkov²

¹Laboratory of Ecosystems Biogeochemistry, Institute of Ecology and Geography, Siberian Federal University, Krasnoyarsk, Russian Federation (mbryukhanova@sfu-kras.ru)

²Laboratory for complex studies of forest dynamics in Eurasia, Siberian Federal University, Krasnoyarsk, Russian Federation

Air temperature increase and change in precipitation regime have a significant impact on northern forests leading to the ambiguous consequences due to the complex interaction between the ecosystem plant components and permafrost. One of the major interests in such circumstances is to understand how tree growth of the main forest species of the Siberian North will change under altering climatic conditions. In this work, we applied the process-based Vaganov-Shashkin model (VS - model) of tree growth in order to estimate the daily impact of climatic conditions on tree-ring width of larch trees in northeastern Yakutia (*Larix cajanderi* Mayr.) and eastern Taimyr (*Larix gmelinii* Rupr. (Rupr.) for the period 1956-2003, and to determine the extent to which the interaction of climatic factors (temperature and precipitation) is reflected in the tree-ring anatomical structure. Despite the location of the study sites in the harsh conditions of the north, and temperature as the main limiting factor, it was possible to identify a period during the growing season when tree growth was limited by lack of soil moisture. The application of the VS-model for the studied regions allowed establishing in which period of the growing season the water stress is most often manifest itself, and how phenological phases (beginning, cessation, and duration of larch growth) vary among the years.

The research was funded by RFBR, Krasnoyarsk Territory and Krasnoyarsk Regional Fund of Science, project number 20-44-240001 and by the Russian Ministry of Science and Higher Education (projects FSRZ-2020-0010).